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ABSTRACT

The goal of this panel was to improve teacher training and teaching effectiveness through applied behavior research in instructional settings. Eight approaches for achieving this goal and for organizing suggested research programs were adopted and discussed. The first of these focused on an increase in the utilization of applied behavior analysis in the preservice education of teachers. The second discussed the development of procedures for installing and maintaining effective teaching and teacher education techniques and systems in new settings. The third approach presented procedures for the development of more effective teacher performance through teacher training, and the development and improvement of existing teacher support systems. The fourth approach concerned the development, through empirical research, of systematic procedures that could be used to define the goals and objectives of educational programs. The development of a community education training program for parents was discussed in the fifth approach. The sixth focused on the development and evaluation of measures of teaching processes and outcomes. The seventh concerned developing and testing methods by which teachers and teacher-training institutions can make themselves more accountable for their performance. The last approach dealt with developing criteria for the funding of educational research which aim to ensure outcomes of direct relevance to teachers in attaining their instructional objectives. (BD)

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NIE CONFERENCE ON STUDIES IN TEACHING

PANEL 3

TEACHING AS BEHAVIOR ANALYSIS

GOAL STATEMENT

To improve teacher training and teaching effectiveness through applied behavior research in instructional settings.

PARTICIPANTS

Dr. Donald Bushell, Jr. (Chairperson), Department of Human Development, University of Kansas

Dr. Wesley C. Becker, Department of Special Education, University of Oregon

Dr. David Born, Department of Psychology, University of Utah

Dr. Robert P. Hawkins, Psychology Department, Western Michigan University

Mr. Girard Hottleman, Massachusetts Teachers Association

Dr. K. Daniel O'Leary, Department of Psychology, SUNY at Stony Brook

Dr. Beth Sulzer-Azaroff, University of Massachusetts

Dr. Carl Thoresen, Stanford Center for Research and Development in Teaching, Stanford University

Mr. Douglas Wilson, Mills Junior High School, Sacramento, California

Ms. Judith Jenkins (Secretary), Department of Human Development, University of Kansas

ADVISORY MEMBERS

Dr. Curt Braukmann, Department of Human Development, University of Kansas

Mr. Gilbert Hoffman, Bryan Elementary School, Washington, D. C.

REVIEWERS

Dr. W. Stewart Agras, M.D., Department of Psychiatry and Behavioral Sciences, Stanford University

Dr. Sidney W. Bijou, Child Behavior Laboratory, University of Illinois

Dr. R. Vance Hall, Juniper Gardens Children's Project, University of Kansas

Dr. B. L. Hopkins, John T. Stewart Children's Center, University of Kansas

Washington, D.C.
December, 1974

N. L. Gage, Editor
Kent Viehoever, Coordinating Editor

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PREFACE

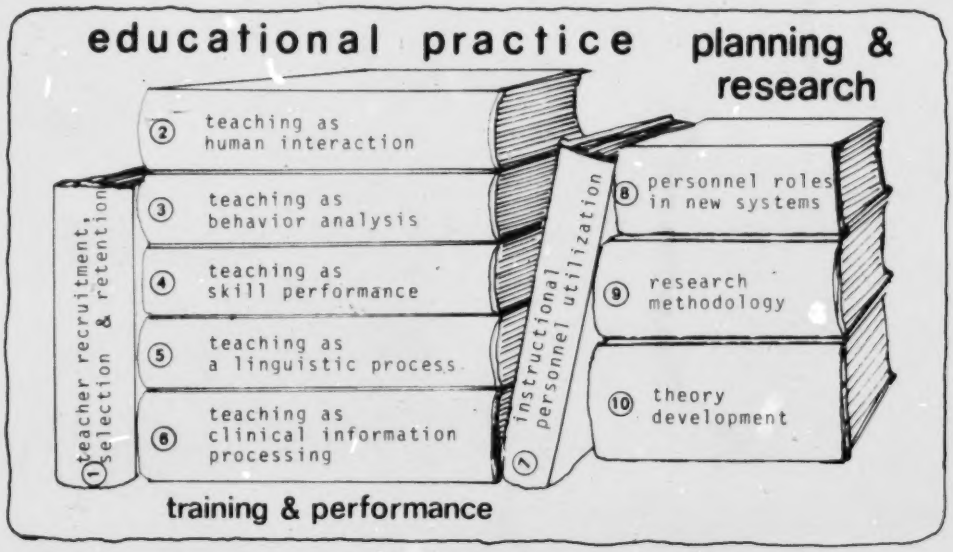
The volume before you is the report of one of ten panels that participated in a five-day conference in Washington during the summer of 1974. The primary objective of this Conference was to provide an agenda for further research and development to guide the Institute in its planning and funding over the next several years. Both by the involvement of some 100 respected practitioners, administrators, and researchers as panelists, and by the public debate and criticism of the panel reports, the Institute aims to create a major role for the practitioner and research communities in determining the direction of government funding.

The Conference itself is seen as only an event in the middle of the process. In many months of preparation for the Conference, the staff met with a number of groups -- students, teachers, administrators, etc. -- to develop coherent problem statements which served as a charge to the panelists. Panel chairmen and others met both before and after the Conference. Several other panelists were commissioned to pull together the major themes and recommendations that kept recurring in different panels (being reported in a separate Conference Summary Report). Reports are being distributed to practitioner and research communities. The Institute encourages other interest groups to debate and critique relevant panel reports from their own perspectives.

The Conference rationale stems from the frank acknowledgment that much of the funding for educational research and development projects has not been coordinated and sequenced in such a way as to avoid undue duplication, yet fill significant gaps, or in such a way as to build a cumulative impact relevant to educational practice. Nor have an agency's affected constituencies ordinarily had the opportunity for public discussion of funding alternatives and proposed directions prior to the actual allocation of funds. The Conference is thus seen as the first major Federal effort to develop a coordinated research effort in the social sciences, the only comparable efforts being the National Cancer Plan and the National Heart and Lung Institute Plan which served as models for the present Conference.

As one of the Conference panels points out, education in the United States is moving toward change, whether we do anything about it or not. The outcomes of sound research and development -- though only a minute portion of the education dollar -- provide the leverage by which such change can be afforded coherent direction.

In implementing these notions for the area of teaching, the Conference panels were organized around the major points in the career of a teacher: the teacher's recruitment and selection (one panel), training (five panels), and utilization (one panel). In addition, a panel was formed to examine the role of the teacher in new instructional systems. Finally, there were two panels dealing with research methodology and theory development.


educational practice
planning & research
② teaching as human interaction
③ teaching as behavior analysis
④ teaching as skill performance
⑤ teaching as a linguistic process
⑥ teaching as clinical information processing
① teacher recruitment, selection & retention
⑦ instructional personnel utilization
⑧ personnel roles in new systems
⑨ research methodology
⑩ theory development
training & performance

Within its specific problem area, each panel refined its goal statement, outlined several "approaches" or overall strategies, identified potential "programs" within each approach, and sketched out illustrative projects so far as this was appropriate and feasible.

Since the brunt of this work was done in concentrated sessions in the space of a few days, the resulting documents are not polished, internally consistent, or exhaustive. They are working papers and their publication is intended to stimulate debate and refinement. The full list of panel reports is given on the following page. We expect serious and concerned readers of the reports to have suggestions and comments. Such comments, or requests for other panel reports, should be directed to:

Assistant Director
Program on Teaching and Curriculum
National Institute of Education
1900 M Street, N.W.
Washington, D. C. 20208

As the organizer and overall chairman for the Conference and editor for this series of reports, Professor N. L. Gage of Stanford University richly deserves the appreciation of those in the field of teaching research and development. The panel chairpersons, singly and together, did remarkable jobs with the ambitious charge placed before them. Special acknowledgments are due to Philip Winne of Stanford University and to Arthur Young & Company for coordination and arrangements before, during, and after the Conference. But in sum toto, it is the expert panelists -- each of whom made unique contributions in his respective area -- who must be given credit for making the Conference productive up to the present stage. It is now up to the reader to carry through the refinement that the panelists have placed in your hands.

Garry L. McDaniels
Program on Teaching and Curriculum

LIST OF PANEL REPORTS AND CHAIRPERSONS

1. Teacher Recruitment, Selection, and Retention, Dr. James Deneen, Educational Testing Service
2. Teaching as Human Interaction, Dr. Ned A. Flanders, Far West Laboratory for Educational Research and Development
3. Teaching as Behavior Analysis, Dr. Don Bushell, Jr., University of Kansas
4. Teaching as Skill Performance, Dr. Richard Turner, Indiana University.
5. Teaching as a Linguistic Process in a Cultural Setting, Dr. Courtney Cazden, Harvard University
6. Teaching as Clinical Information Processing, Dr. Lee S. Shulman, Michigan State University
7. Instructional Personnel Utilization, Dean Robert Egbert, University of Nebraska
8. Personnel Roles in New Instructional Systems, Dr. Susan Meyer Markle, University of Illinois
9. Research Methodology, Dr. Andrew Porter, Michigan State University
10. Theory Development, Dr. Richard Snow, Stanford University

- Conference on Studies in Teaching: Summary Report, Dr. N. L. Gage, Stanford University

CHAIRMAN'S NOTE

The several members of the panel brought different backgrounds and different interests to the conference discussions. Those differences are preserved in this report. Where panelists spoke different languages there has been no attempt to translate those differences away. Because of the working arrangements achieved by the panel, it was often the case that a researcher might contribute a program or project description to an approach being developed by a teacher, or a teacher might contribute to an approach being developed by a researcher. The arrangement was very beneficial and contributed greatly to the productivity of the panel. The occasional inconsistencies in style and organization which result in the approach descriptions because of this practice are minor in comparison to the substantial consensus it permitted.

Don Bushell, Jr.

INTRODUCTION

Statement of Goal

The goal of the National Institute of Education in supporting teaching as behavior analysis should be to improve teacher training and teaching effectiveness through applied behavior research in instructional settings.

Considerable time was spent in the exact wording of the goal statement since the panel required that (a) it should be precise enough to avoid misinterpretations, and (b) it should still be broad enough to allow for a variety of applied research activities.

Panel members agreed, after discussion, that research in this area is fundamentally problem-oriented (that is, designed with the aim of developing and evaluating procedures to improve teacher training and teaching effectiveness). It was recognized, however, that the development of these procedures would occasionally necessitate preliminary research in more controlled instructional settings than those in the natural environment. For example, a procedure might be tested in a university-run "laboratory" setting for teaching, before being field-tested in a school system. It was also recognized that, while the emphasis of this conference was placed on the formal educational system, "teaching" was also an informal social-learning process, engaged in by many people other than those in official teaching roles. Although the informal settings for learning were not specifically included in the panel's goal statement, it seemed likely that procedures developed in more formal settings could be relevant for informal learning settings also. Finally, by including college and university faculty in the category of teachers, the Panel intended to make explicit its interest in improving teaching at all educational levels.

The goal statement was clarified as follows:

1. Instructional settings are intended to include regular classrooms, remedial settings, and other settings directly related to the performance of students. This instruction can take place in pre-schools, elementary and secondary schools, community education programs, colleges, and universities.

2. Applied behavior research involves the application of principles and techniques of behavior change in the design and implementation of procedures and environments to facilitate attainment of specified goals.

Definition of Applied Behavior Analysis

Baer, Wolf, and Risley (1968), describe the defining characteristics of applied behavior analysis by noting that, "a study which purports to be an applied behavior analysis is":

applied -- the behavior, stimuli, and/or organism under study are chosen because of their importance to man and society, rather than their importance to theory.
behavioral -- deals with physical events that are precisely measurable.
analytic -- an experimenter has achieved an analysis of a behavior when he can exercise control over it.
technological -- a procedural description is technological if a typically trained reader can replicate that procedure well enough to produce the same results, given only a reading of the description.
conceptually systematic -- procedures are related to basic principles.
effective -- the procedure makes a large enough difference to be socially important.
display some generality -- effects are durable over time, or occur in a wide variety of environments, or occur in a wide variety of related behaviors.

Consequently, applied behavior research requires the experimental evaluation of the effect (function) of specific procedures in a way that directly relates process and outcome variables. Procedures are judged effective to the extent they:

1. Achieve specified goals
2. Are replicable
3. Are preferred by consumers
4. Are practical (including economically) in the educational system and community in which they are applied
5. Are disseminable

Goals and objectives may include the full range of student and teacher performance in personal, social, and academic areas (including internal cognitive and emotional events as evidenced by observable behavior change). Specific goals and objectives are determined by the responsible persons involved. These responsible persons are the immediate consumers of the services offered by the procedures, their agents, or advocates. The development of procedures for setting goals is in itself a problem that can be experimentally analyzed.

The panel wishes to endorse and consider incorporated in this report the ethics guidelines currently being prepared for NIMH by Stephanie Stolz and Saleem Shah entitled "Guidelines for administrators of programs using behavior modification procedures."

Development of Approaches

Eight approaches for achieving the panel's goal were initially adopted. Their adoption followed extensive discussion by the panel concerning what areas of research should have high priority. It was recognized that the eight approaches are highly interrelated; nevertheless, each approach appeared to provide a framework for research with some unique characteristics.

It was then decided to allocate the various approaches to different panel members, who worked out possible research programs within a particular approach. These programs were then distributed to the other panel members for their comments. Revisions and additions were made as a result of the feedback given. Panel members then wrote descriptions of projects within their particular approach and for any other approaches for which they wished to do so (and for which there was time).

When the several products of these activities were assembled and distributed to the panel members after the close of the conference, a number of redundancies were evident. In particular the approach dealing with parent education procedures was found to be integral to other approaches dealing with (a) preservice training, (b) professional development, and (c) goal setting procedures. Consequently, it was decided to distribute the content of the original Approach 5 among these three other approaches, but to retain the approach in the listing in order to emphasize that education extends beyond the bounds of the school. Following is a list of approach titles and definitions.

Approach 3.1: Preservice training -- Increase the utilization of applied behavior analysis in the preservice education of teachers.

Approach 3.2: Dissemination procedures -- Develop procedures for installing and maintaining effective teaching and teacher education techniques and systems in new settings.

Approach 3.3: Professional development -- Examine procedures for the development of more effective teacher performance through teacher training, and the development and improvement of existing teacher support systems.

Approach 3.4: Goal setting procedures -- Develop, through empirical research, systematic procedures that can be used to define the goals and objectives of educational programs.

Approach 3.5: Parent education -- Develop a community education training program for parents.

Approach 3.6: Process and outcome measures -- Develop and evaluate measures of teaching processes and outcomes.

Approach 3.7: Accountability -- Develop and test methods by which teachers and teacher-training institutions can make themselves more accountable for their performance.

Approach 3.8: Funding procedures -- Develop criteria for the funding of educational research which aims to ensure outcomes of direct relevance to teachers in attaining their instructional objectives, and which incorporate procedures acceptable to the community institutions involved.

The eight approaches identified by Panel 3 are discussed in the sections that follow, and include the programs and projects developed.

APPROACH 3.1

PRESERVICE TRAINING -- INCREASE THE UTILIZATION OF APPLIED BEHAVIOR ANALYSIS IN THE PRESERVICE EDUCATION OF TEACHERS

The educational technology developed by applied behavior analysis has particular relevance for teacher training programs. The utilization of this technology in teacher preparation, as set forth in the approach, includes consideration of behavior analysis as (a) a substantive content area, (b) an approach to developing the trainee's personal-social skills, and (c) a methodology for teaching other content areas. These three categories provide the general framework for assessing the background and current knowledge in this approach.

Empirical studies of behavior change (teaching) procedures that have contributed to the substantive content of applied behavior analysis have had a relatively brief yet productive history. Rationale presented by Keller and Schoenfeld (1950), Skinner (1953), and Wolpe (1958) and further elaborated by Bandura (1961), Skinner (1961), Bijou and Baer (1961) and Staats and Staats (1963) provide the basis for these studies. An expanding collection of empirical studies has developed systematic procedures for changing behavior through the use of contingent reward, stimulus control, environmental design, social modeling, and systematic desensitization. Several summaries of the techniques and results of behavior analysis concepts and methods in different settings have been published within the past five years (e.g., Bandura, 1969; Becker, Engelmann and Thomas, 1971; Ramp and Hopkins, 1971; Harris, 1972; O'Leary and O'Leary, 1972; Semb, 1972; Sulzer and Mayer, 1972; Bushell, 1973; Thoresen, 1973; Keller and Ribes-Inesta, 1974; Sherman and Bushell, 1974; and Brigham and Catania, in press). Since 1968, the Journal of Applied Behavior Analysis has served as the primary medium for reporting new developments in the field.

Although behavioral methods offer exciting possibilities for developing teacher and student skills in self-control, only a few studies in this area have been conducted (Thoresen and Mahoney, 1974). The promising and sometimes dramatic results of behavior analysis procedures strongly warrant their controlled examination in teaching and teacher training settings with a broad array of personal, social, and academic behaviors.

In spite of (or perhaps because of) the vigorous and rapid development of behavior analysis in education, it is at present a technology that is not utilized in most teacher training programs. Consequently, little is known about the use of behavior analysis methods in teacher training (McDonald, 1973), especially in the development of personal and social-emotional skills. Further, these methods have generally not been used at the secondary level except in the area of counseling and psychological services. With the notable exception of PSI (Keller's Personalized System of Instruction), little has been done in higher education to date.

Program 3.1.1: Behavior Analysis as Course Content -- Develop Ways to Teach Trainees the Concepts, Methods, and Procedures of Behavior Analysis in Education.

Stimulated in part by the successes of programmed instruction in the late 1950s, reports of successful classroom applications of behavior analysis began to appear in the early 1960s. These reports (e.g., Zimmerman and Zimmerman, 1962; Birnbrauer, Wolf, Kidder and Tague, 1965; Harris, Wolf and Baer, 1964; and Staats and Butterfield, 1965) were quickly augmented by others to constitute a set of procedures that teachers could use to advantage in regular classroom settings. Now that a practical technology of classroom behavior analysis exists, effective ways must be devised to make it a part of established teacher training programs. Further, and perhaps more important, ways must be devised to experimentally evaluate the effects of including behavior analysis training at the perservice level on the initial classroom performance of teachers. In short, the question to be answered is: What behavior analysis techniques can be taught to trainees that will be most beneficial to them as teachers?

Many projects might be designed to meet the goals of this program. The following examples merely illustrate the possible range of these projects rather than serve as fully developed project descriptions.

Project 3.1.1.1: Devise Acceptable Ways of Teaching Behavior Analysis Technology to the Teachers of Trainees.

Project 3.1.1.2: Devise Preservice Laboratory Sequences That Explicitly Approximate the Classroom Performance Requirements of the Practicing Teacher.

Project 3.1.1.3: Develop Systems of Feedback From the Field That Can Alter and Refine the Teaching of Behavior Analysis at the Preservice Level.

Program 3.1.2: Personal-Social Skills Training -- Develop a Personal-Social Skills Training Program for Preservice Teachers (Trainees).

Personal-social skills include three areas: (a) internal actions, e.g., self-verbalizations, physiological responses, internal imagery; (b) external behaviors, e.g., social praise, non-verbal action; and (c) the arrangement of environments to encourage social actions. Training in these skills involves their operational definition and the setting of performance criteria. The development of a training program involves the evaluation of functional relationships between teacher training and teacher behaviors. The program should be designed primarily to fit into existing teacher training programs.

The development of theories or procedures related to research on the personal-social problems of teachers (particularly on their effects on classroom performance and student behavior), has remained at a highly descriptive level (e.g., Jersild, 1955; Fuller, 1969). Although teacher training institutions have sometimes recognized the need for a systematic program in teacher training concerned with personal-social behaviors, they have not developed such programs (Coates, 1974; Fuller, in press). While some work using encounter-sensitivity groups with teachers has been reported, results have been difficult to interpret due to the non-empirical and uncontrolled design of the studies.

In a broader sense, work in the affective domain (cf. the Taxonomy of Educational Objectives in the Affective Domain) as compared with that for the cognitive domain, remains an acknowledged yet relatively unexplored realm in teaching and teacher training. Few teacher educators argue that the personal "competencies" of teachers are unrelated to the personal-social as well as academic performance of students. However, data from controlled studies are not available.

Recent literature reviews such as those by Coates (1974), Coates and Thoresen (1974), Fuller (in press), and rationales presented by Gage (1973), clearly substantiate the lack of systematic teacher training programs aimed at improving the personal-social skills of teachers. Further, these reviews have identified a number of specific problems of teachers deserving attention, such as anxiety, "insensitivity" (in terms of effects on student behavior), depression, low self-esteem, and sleeping problems.

Studies are needed both to develop methods of training skills in these personal-social areas, and to examine in what ways teacher competencies in these areas influence their own and their students' classroom performance.

The following examples of projects were formulated by the Panel:

Project 3.1.2.1: Develop Teacher Stress-Tension Management Training. Anxiety has long been recognized as a major problem of teachers (Hicks, 1933; Jersild, 1955; NEA, 1938). Almost all efforts to help teachers reduce or control anxiety have failed bacause of inadequate treatments, faulty research designs, global definitions, and irrelevant paper-and-pencil measures. Anxiety can, however, be conceptualized as situation-specific behavior, both internal and external. Further, controlled research can yield invaluable data on how teachers can learn and employ stress-tension management skills in actual classroom situations. Teachers in training, especially, need these coping skills to reduce the anxieties they experience during training and their first year of teaching.

This project then, would seek to (a) develop a training program for preservice teachers in the management of stress and tension, (b) evaluate the effects of such training on a variety of behaivor measures during teacher training, and (c) evaluate the effects of such training on teachers' performance during their first year of classroom teaching.

Project 3.1.2.2: Develop and Evaluate Techniques for the Prevention and Management of Teacher Depression. Depression is one of the most prevalent personal problems for which individuals seek help (Davison and Neale, 1974). Teachers, like many others, often experience depression, sometimes using drugs (prescribed and otherwise) to reduce the problem (Coates and Thoreson, 1974). Until recently, depression was viewed as a generic "disease" with its etiology centered in unconscious, early life experience. Recently, however, a learning skills view has suggested that depression consists of a composite of overt and covert behaviors that are influenced primarily by current environmental events (Lewinsohn, in press; Seligman, in press). Thus, a person can learn to pinpoint these events which may be functionally related to the entire range of behaviors termed depressive. This project seeks to develop a training program which would enable beginning teachers to learn the skills necessary to control and modify depressive behaviors.

Project 3.1.2.3: Develop Procedures for the Self-Control of Insomnia in Teachers. This project is suggested for future discussion and development.

Program 3.1.3: Behavior Analysis as Method -- Devise Systems Which Use Behavior Analysis Methods in the Teaching of Trainees.

Behavior analysis in education is a substantive content area, but it is also an instructional methodology. Consequently, the projects within this program area are concerned with developing techniques for utilitizing behavior analysis procedures in the process of teaching trainees. Systematic behavior analysis methods of preservice training remain largely undeveloped, and evaluation schemes are comparably limited. The unresolved issue addressed by this program is that of the impact of a specific method (behavior analysis) on consequent teaching.

A few recent studies have provided some extremely promising suggestions for the development of improved training strategies. These include analyses of the effects of feedback (e.g., Cooper, Thomson and Baer, 1970; Panyon, Boozer and Morris, 1970; Thomas, 1972; Rule, 1972; and Saudargas, 1972), modeling (e.g., a videotape demonstrating token delivery), and analyses of the effects of Personalized Systems of Instruction (PSI) courses in a variety of content areas (e.g., physics - Green, 1971); educational psychology - Hapkiewicz, 1972; psychology - Semb, 1974).

A variety of projects within this program area deserve development. Those that follow are illustrative.

Project 3.1.3.1: Analyze the Content and Sequencing of Training Programs With Specific Reference to Their Intended Outcomes. The manner in which educational experiences are sequenced is usually a function of a program supervisor's armchair assessment of what constitutes a "good" or logical sequence. Sometimes students voice a desire to have earlier laboratory or practicum experiences or some other program modification. Those changes may be incorporated into the sequence, but, as McDonald (1973) states: "Behavioral analyses of teaching tasks have not preceded the design of those programs. Descriptions of desired teaching behavior are frequently too general. Many diverse training objectives are accepted as desirable, but no systematic ordering of these has been developed" (emphasis added). This project would complete a thorough task analysis of teacher training requirements based on a systematic ordering of the intended outcome objectives.

Project 3.1.3.2: Expand the Utilization of PSI Courses in Pre-Service Training Programs. Personalized Systems of Instruction (PSI) have been widely applied in college level courses since Keller published his paradigmatic article in 1968. The Keller plan and its variations represent an instructional technique explicitly designed according to learning principles in a classic pattern closely related to programmed instruction. Course material usually consists of small units which require frequent responding by the students, who are free to work at their own rates. Each unit must be completed at a high level of mastery before new material is attempted, and the use of proctors (advanced students) permits frequent testing, tutoring, and relatively immediate feedback to the student. In most PSI courses, lectures and demonstrations are used for motivation rather than for information content. In comparison with conventional lecture courses, PSI has been shown to produce superior performance on traditional examinations (Born, Gledhill and Davis, 1972; McMichael and Cory, 1969; Sheppard and MacDermont, 1970), more favorable ratings on questionnaires (Born and Herbert, 1970; Gallup, 1969), and greater amounts of studying (Born, Davis, Whelan, and Jackson, 1972). The widespread interest in PSI applications across many disciplines has stimulated the publication of a PSI newsletter, edited by G. Sherman and colleagues at Georgetown University.

PSI has not, however, been widely applied in teacher training programs. Given the well documented advantages of this instructional procedure, the Panel considered its wider application in training programs to be essential. Research and development effort in this project should seek to develop and implement PSI courses for preservice

teachers, and to further refine control over variables that affect performance in PSI courses in general (e.g., proctor training procedures; proctor performance evaluations; unit size; study question design; costs to teaching personnel).

Project 3.1.3.3: Devise Performance Measures of Teaching That Can Enable Repeated (Continuous) Assessment of Improvement From the Preservice Level Through the Inservice Career of a Teacher. Current measures of trainee performance are not directly related to the performance requirements of a classroom teacher. With the identification of the several components of a functional training sequence (Project 3.1.3.1) it becomes possible and necessary to design measurement and feedback systems that record the progress of a trainee toward mastery of essential classroom management and curriculum-related instructional skills. Such a strategy assumes continuing communication between training institutions and school districts so that measures obtained in the field can be used to alter and improve the instruction of trainees. At the same time, measures of this type are seen as necessary to the full development of performance-based teacher certification.

Project 3.1.3.4: Determine Which Methods of Instruction are Preferred by Trainees. This project is suggested for further discussion and development.

APPROACH 3.2

DISSEMINATION PROCEDURES -- DEVELOP PROCEDURES FOR INSTALLING AND MAINTAINING EFFECTIVE TEACHING AND TEACHER EDUCATION TECHNIQUES AND SYSTEMS IN NEW SETTINGS

This approach focuses on the parallel questions of transferring experimental programs from laboratory school to classroom and maintaining the effectiveness of innovative technique and systems once they are installed.

The experimental literature on the dissemination and maintenance of innovation in education is extremely limited. Experience with Follow-Through programs and the model program for pre-delinquent youth (Achievement Place) points out some of the difficulties inherent in dissemination.

The experiences of Engelmann and Becker in Follow Through indicate that when procedures first tested under laboratory school conditions were moved into the field on a wide-scale basis (400 classrooms in 20 districts), the programs had to be revised and supplemented. The programs had to include (a) procedures that were more readily taught to teachers, (b) the training of teachers on a continuing basis, (c) the monitoring of both teaching procedures and ongoing student progress (quality control) to guide training and maintain performance, and (d) the development of local support systems (administrative support, union support, parent support and local monitoring and training procedures). (Becker et al., 1971.)

Bushell's Behavior Analysis Follow Through model has had similar experiences in working with 300 classrooms in 12 districts. A recent report by Phillips, Phillips, Fixsen and Wolf (1973) on the dissemination of the Achievement Place model for home-like treatment centers for pre-delinquents further demonstrate the difficulties of transitions from laboratory school to field. Program procedures had to be redesigned so they would function more readily (i.e., be more easily trained for and followed) and a quality-control feedback system was required to help maintain and improve the exported systems.

Recent reports on the maintenance of innovative systems (e.g. Ford Foundation Report, 1973; Rogers, 1968) suggest that only where the original "great man" remained involved did an innovative procedure survive over any length of time.

Other research on the maintenance of gains when children are moved from experimental settings back to regular classrooms (Walker and Buckley, 1972) shows that explicit procedures are needed to ensure maintenance of a behavior change. In the Walker studies, training of regular classroom teachers in behavior management skills was important to the maintenance of gains in appropriate behavior by formerly aggressive children. Extrapolation from this finding would suggest that changes produced in teacher behavior through a special intervention program might be lost over time if supportive feedback was not provided by principals, another teacher or supervisor, or by data on student behavior.

These findings indicate that a specific technology must be developed that can improve both the dissemination and the maintenance of innovative programs and procedures.

Two programs were identified by the Panel under this approach.

Program 3.2.1: Dissemination Specifications -- Develop Procedural Specifications for Program Design and Evaluation That Will Improve Disseminability.

The purpose of this program is to formulate specifications that identify and describe criteria for designing and evaluating innovative programs that affect several indicators of disseminability. Trainability of components and satisfaction of program teachers, students, and other participants are two of these indicators. Others would include quality control feedback systems to monitor ongoing progress, adequacy of implementation system, and independence of program effects from the presence of the originator.

Project 3.2.1.1: Evaluate the Disseminability of Educational Programs. This is a generic project for which there might be a series of independent efforts. One effort in this project, for example, would be to develop specifications for disseminability of reading programs X, Y, and Z, through experimental analysis of such factors as trainability of component parts, adequacy of the feedback system, adequacy of the implementation system, and satisfaction of teachers and students using the programs.

Efforts should be made in a variety of settings in order to permit more generalizable conclusions.

Program 3.2.2: Dissemination Techniques -- Develop Procedures to Disseminate New Programs That Will Improve Their Implementation and Maintenance.

This program would devise procedures that include involvement of all vested interests in the evaluation and decision to adopt the program. Trained implementors and a training program must be incorporated. If

training is undertaken initially by people outside the system adopting the program, provision is needed for transferring the control of training and supervision to local personnel. Alternatively, local implementors can be trained as trainers or supervisors in the first place. Procedures for training local administrators, union representatives, parents, and supervisors in the support and maintenance of the program are essential. The same is true of procedures for minimizing the stresses of the new efforts required by teachers to implement a program change (incentives, temporary aides, etc.). Finally, procedures for local monitoring of program effects in terms of teacher performance, student outcomes, consumer satisfaction, and acceptability within the total system must be included. Three projects were suggested within this program area.

Project 3.2.2.1: Evaluate Components of Implementation Procedures. (This project provides an example of a design which could be used for a series of projects.) This project would evaluate the relative effectiveness of possible implementation procedures when disseminating new programs. The procedures to be compared include the following which are ordered from least to most expensive where possible (not all need to be used in a given study):

1. Teacher reads the teacher's manual.
2. Teacher is given X amount of training prior to start of program.
3. Teacher is provided with continuing feedback on (1) teacher behavior, (2) student performance, (3) student satisfaction.
4. Principal or supervisor is trained to support teacher implementation.
5. In-classroom training is given by person highly competent, in program X times a week.
6. Teacher incentives are provided for program implementation.

The sequence of events in carrying out this project would be the following:

1. Select one educational objective (e.g., reduction in classroom behavior problems; increase in productive learning activities; teaching reading skills; teaching corrective reading to 4-7th grades; etc.)
2. Select three or four programs which could reach the objective and which have (or can be provided with) the component variables as listed under "Objectives" above.
3. Collect continuing data on:
   a. Teacher performance (variables determined by program requirements).
   b. Student performance.
   c. Consumer satisfaction (teacher, students, principal, parents).
   d. Costs.
4. Introduce components one at a time. Groups of 5-10 teachers could be provided with new components at different times to provide multiple-baseline control. Also, if the satisfaction level of the teachers or students drop below an acceptable level, or student performance is not acceptable, new procedures should be introduced.

The key decision points or progress check points during the project would be the following:

1. If performance is so low as to endanger a child's progress, move to a stronger procedure.

2. If performance is at or near criterion, do not go to stronger procedure in that study.

3. Vary sequence in introducing components according to findings in initial studies.

4. Seek a most cost-effective package in later studies.

Studies following this general design could be carried out within the time limits of a single school year with maintenance effects studied in the subsequent year. The time spent on a component may be two weeks to two months or more depending on observed effects.

A cumulative set of projects in this design would yield conclusions about the most desirable procedures for different types of programs. Staggered funding (not all funded at once) of projects would be necessary to allow early results to influence subsequent designs.

Project 3.2.2.2: Explore Different Maintenance Strategies. When a program has been implemented as in 3.2.2.1, the question of studying maintenance is appropriate. An additional year of consistent, periodic data collection could make possible the study of teacher maintenance effects with new students as a function of program and installation conditions.

Additional maintenance studies could recognize that maintenance is a function of environmental events also. Some variables to be studied at the project level include:

1. The use of contracting (before the fact) that sets clear goals for the teacher and includes rewards for meeting them. A method of evaluating goal attainment would also be specified.

2. The use of systems for feedback on teacher and student performance. These systems would involve, for example, feedback from the school principal.

3. The use of self-managed systems for feedback on teacher and student performance.

4. The use of intermittent follow-up procedures (involving outside and local personnel) to maintain teacher performance.

This project idea requires further development.

Project 3.2.2.3: Implement Large-Scale Programs Through Participation by and Formation of Agreements With Critical System and Community Personnel. This project needs to be further developed.

APPROACH 3.3

PROFESSIONAL DEVELOPMENT -- EXAMINE PROCEDURES FOR THE DEVELOPMENT OF MORE EFFECTIVE TEACHER PERFORMANCE THROUGH TEACHER TRAINING AND THE DEVELOPMENT AND IMPROVEMENT OF EXISTING TEACHER SUPPORT SYSTEMS

This approach would have the following objectives:

1. To further evaluate effective procedures (such as modeling, feedback, positive consequences, and related training strategies) for producing and maintaining improved teacher performance.

2. To evaluate procedures for enhancing the skills of teacher-support personnel (psychologists, social workers, counselors) in new roles as (a) consultants and (b) trainers of teachers in more effective classroom procedures for dealing with social and behavior problems.

3. To develop procedures for enhancing the skills of curriculum specialists in serving a training-monitoring-helping function for the classroom teacher.

4. To evaluate alternative administrative structures and administrative roles in terms of their effects on student and teacher performance and satisfaction.

5. To evaluate alternative procedures for initiating, setting goals for, and selecting methods for teacher improvement programs.

Program 3.3.1: Inservice Procedures -- Produce Training Procedures for Generating and Maintaining Improved Teacher Performance.

Inservice training of teachers and development of support personnel goes on in most school districts in some form. For the most part, approaches to this training have not been subjected to experimental analysis to determine the differential effectiveness of alternative procedures. A few recent studies using behavior analysis technology suggest that some approaches to training in specific classroom management techniques are more effective than others. For example, procedures that involve modeling of desired behaviors (see Koran, Snow and McDonald, 1971), feedback on performance in specific classroom situations, (Cooper, Thompson and Baer, 1970 and positive consequences for improved performance (e.g., praise from the principal, (Cossairt, Hall and Hopkins, 1973) produce more effective change than simply instructing the teacher about better ways to do things.

Project 3.3.1.1: Develop an In-Classroom Teacher Training Technology. An effective way to train teachers while they are performing as teachers needs to be developed. Presently "master" teachers typically provide infrequent feedback and consultation to student

teachers and fellow teachers at whatever times such discussions can be "worked into" the teaching day. Usually these occasions occur during breaks and at the end of the school day when students are not around. Many problems are probably better remedied on the spot, but procedures are needed for diagnosing problems, selecting remedial strategies, and presenting those strategies to teachers with an eye to affecting their performance without disrupting the teacher-learning environment.

One possible method for conducting this project would consist of the following steps:

1. Develop procedure for identifying teaching problems.
2. Develop procedures for selecting appropriate remedial strategies.
3. Develop delivery procedures which permit communication with teachers without disrupting the teaching-learning environment.
4. Develop monitoring procedures which permit continual assessment and revision of Steps 1-3.

Project 3.3.1.2: Design and Evaluate Teacher Workshop Components For Their Effect on Teacher Behavior. Although workshops for teachers provide a common mechanism for updating teaching methods in public schools, the effectiveness of workshops continues to be questioned (e.g., Katz and Zlutnick, 1974). Procedures need to be developed which will permit assessment of the impact of workshop components (see Project 3.6.1.1) on the classroom performance of students and teachers in order to optimize the effectiveness of this training vehicle.

One possible method for conducting this project would consist of the following steps:

1. Identify common categories of workshop activities.
2. Design procedures for determining whether activities achieve their objectives. (For example, if a new teaching philosophy is espoused, it would be necessary to determine whether workshop participants "understand" the new philosophy following a lecture in which it is outlined.)
3. Design procedures for determining how workshop participants use workshop activities in their daily teaching.
4. Design procedures for determining whether revised teaching strategies are having the desired impact on students.

Project 3.3.1.3: Evaluate Teacher Training Techniques Which Involve Simulated Teaching (e.g., Modeling, Role Playing, etc.) In the absence of teacher training techniques that permit training in ongoing classrooms, some forms of training are attempted in contrived teaching settings (e.g., role playing in which a colleague acts out

a disruptive child in a classroom). Although some training can obviously occur in such simulated teaching settings, there is a need to determine the strengths, weaknesses, and limitations of these various training approaches as ways to develop appropriate teacher classroom behaviors.

Project 3.3.1.4: Identify and Implement Techniques to Maintain Effective Teacher Skills (see Approach 3.2).

Project 3.3.1.5: Develop Procedures for Identifying Effective Classroom Teachers (With Consumer Satisfaction Measures and Teaching Effectiveness Data) and Teaching Them Dissemination Skills to Enhance Their Use as District Resource Personnel.

Program 3.3.2: Training of Support Personnel -- Expand the Roles of Teacher-Support Personnel (Psychologists, Social Workers, Counselors, etc.) in Helping Teachers Deal More Directly in Dealing with Social and Behavior Problems in the Classroom.

For several years now a number of behavioral psychologists (Hall; Becker; Madsen; O'Leary) have been suggesting that most children with behavior problems identified by teachers can be helped to show more acceptable (mature) classroom behavior by changing how the teacher uses her attention in the classroom. For example, if the teacher focuses on misbehavior with critical comments, misbehavior is more likely. If she learns to focus praise and attention on positive behavior and goals, behavior problems can be rapidly reduced (Becker, Madsen and Arnold, 1967; Hall et. al., 1968). Other changes in classroom reinforcement procedures (e.g., the use of token systems) have been demonstrated to produce rather dramatic changes with more severely disturbed children (O'Leary and Becker, (1967, Walker and Buckley, 1972). The implications of these studies is that the use of traditional teacher-support personnel (such as school psychologists, counselors, and social workers) in the role of behavioral consultants to teachers could lead to substantial and low-cost improvement in both teacher and student effectiveness and, at the same time, reduce the need for special classes and therapies.

Project 3.3.2.1: Alter the Roles of Teacher-Support Personnel (Psychologists, Social Workers, Counselors) and Measure Their Effects in Terms of Academic and Social Behaviors of Teachers and Students. Children with "special learning difficulties" or behavior problems are often treated as different by their peers and teachers. This different treatment seems to occur particularly for children who have part-time remedial help away from their normal class. The classroom teacher and the teacher-support personnel who are specialists in helping students often have not produced practical programs designed specifically to help the student in his peer-group learning situation within the classroom. There thus seems to be a need for an inservice

training program for teacher-support personnel which will enable them to function more effectively in their role of providing assistance to teachers in the classroom. One method of carrying out this project would consist of the following steps:

1. Identify the skills needed by teacher-support personnel in remedying pupil problems within the classroom.

2. Develop on-going inservice programs to develop skills for teacher-support personnel requiring special consultants.

3. Develop control procedures which will enable measuring the effectiveness of the program. (Both experimental analyses and comparison groups might be appropriate.)

4. Develop procedures to assess the maintenance of the program's effects in the long term, as it is related to teacher satisfaction.

Project 3.3.2.2: Develop a Teacher-Support Personnel Training Program for Elementary Schools. Although support personnel have been involved with elementary teachers for several years, data from well controlled empirical studies are generally lacking. Teachers are generally enthusiastic about having support personnel available, if these personnel possess the skills necessary to assist teachers in improving the personal, social, and academic performance of students. Unfortunately, the professional training of counselors and psychologists as support personnel has generally not been geared to working directly with the elementary school teacher in the classroom (e.g., Moore and Sanner, 1969). Considerable use has been made of teacher aides prepared in behavioral skills, but their effectiveness in the classroom and their training still remains to be evaluated. A few recent studies have dealt with the value of behaviorally trained support personnel (e.g., Mahan, 1971; Cooper, Thomson and Baer, 1970). The Engelmann-Becker program for Follow Through has trained and used over 750 teacher aides for grades K-3 in behavior analysis skills (Becker, 1973); and Bushell's Behavior Analysis Follow Through program has trained and employed over 2,000 parent teachers for the primary grades (Bushell, 1974). Moore and Sanner (1969) have used a behavioral consultation program for elementary school teachers. Perhaps the most systematic training program for teacher support personnel is the consulting teacher program in Vermont (McKenzie, 1972).

The field lacks information about how to train support personnel and how their training affects teacher and student performance. The main objective would be to test such training programs experimentally, using a variety of measures gathered in the training situation and in classrooms.

Program 3.3.3: Curriculum Specialists -- Expand the Role of Curriculum Specialists and Supervisors.

Although data are lacking, experience suggests that in many cases curriculum support personnel have little impact on improving teacher performance in subject area instruction because their activities are largely restricted to program selection and evaluation. Missing is the training function in how to do things better. Behavior analysis research and experiences like Follow Through suggest that retraining curriculum specialists to prepare them for a training-monitoring-helping function in the classroom would greatly improve their contribution to teacher and pupil effectiveness.

Project 3.3.3.1: Assess the Effects on Teachers and Students of Revising the Roles and Skills of Curriculum Specialists to Include In-Classroom Training. The following steps are suggested as a possible method:

1. Obtain pre-measures (baselines) on teacher and public performance, and teacher satisfaction with the curriculum specialist's help in a particular subject. Select teachers for study where the curriculum specialist is not now in a training role.

2. Arrange for control groups of teachers who have no help from a classroom curriculum specialist and who receive visits on a schedule to match Step 5 below.

3. Have implementor pre-train supervisor.

4. Have supervisors then work with the implementor in training teachers in new method. Use training sessions to teach supervisory skills such as Model, Lead, and Test (see Engelmann-Becker Follow Through Supervision and Training Procedures for details).

5. Set up a continuing schedule (aperiodic) for supervisor's visits to classrooms to continue training and reinforce teacher progress.

6. Measure effects on classrooms and costs in relation to pupil and teacher benefits.

The goal of this project would be to demonstrate that the project can be carried out and that it yields benefits to teachers and students that are well worth its cost.

Program 3.3.4: Administrative Support -- Revise Administrator's Roles an Structures so That They Provide More Direct Support for Teacher Performance and Satisfaction.

While much research in educational administration has focused on administrative structure, administrator behavior, and teacher satisfaction, little has been done to follow the effects of administrative practices down to the level of assessing their effects on teacher and student performance. Because administration at the building level is concentrated in the role of the principal, experimental analyses of the performance of this role are particularly needed. To date, investigations have shown that the elementary school principal's professional behaviors can be improved (Daw and Gage, 1967) and that a principal can alter the deviant behavior of children (Brown, Copeland, and Hall, 1972; Copeland, Brown, Axelrod, and Hall, 1972) and, most recently, that the principal can support the academic performance of students (Copeland, Brown, and Hall, 1974). Clearly, the attention of the principal can be a potent consequence for modifying pupil behavior. Further analyses are now called for which will experimentally specify the ways in which principals' attention can be managed to alter and support teacher behavior.

Project 3.3.4.1: Develop Procedures for Evaluating Potential Changes in Teacher and Student Satisfaction and Performance as a Result of Increased Consumer Involvement in Educational Decisions. Although the teaching of democratic structures and procedures is a fundamental part of the curriculum in American school systems, educational institutions are not always run democratically. In many cases curriculum decisions are made without input by students and teachers and, at the level of individual classrooms, students and their parents often have little voice in what, how, or when school-related work is completed. Although ultimate responsibility for educational decisions may continue to rest with the persons who now have that responsibility, it seems likely that clear channels for receiving ideas and reactions from various educational consumers (e.g., students, teachers, school administrators, parents, etc.) could have a marked impact on the quality of education and the satisfaction of various educational consumer groups (see Approach 3.4).

The following steps were recommended as a possible method of carrying out this project:

1. Identify educational consumers.
2. Design procedures for gathering useful consumer input on appropriate educational matters.
3. Select experimental designs for evaluating changes in (a) satisfaction, (b) teaching materials, (c) teaching methods, and (d) teaching effectiveness.
4. Use different but equivalent classes, schools, and school districts as control groups to examine the effects of participation.
5. Assess the effects of teacher participation in decision making by (a) teacher satisfaction measures and (b) teacher effectiveness as measured by pupil gains.

Project 3.3.4.2: Assess the Effects of Direct Involvement of Principals in New Programs Introduced Into a School. It was suggested that implementation might begin with the training of the principal along with the teachers; then the principal would teach the new program for at least 30 minutes daily for 6 months. Throughout this period, assess (a) teacher and pupil performance, and (b) teacher satisfaction with the program and support, as compared with those of control groups where the principal is not involved.

Project 3.3.4.3: Study the Effects on Teacher and Student Performance of Increasing the Time Principals Spend in Monitoring Classroom Progress and Reinforcing Teacher Improvement. This study should be conducted in a school system that provides a continuous progress assessment system for the curriculum (DISTAR, Behavior Analysis Follow Through, IPI, etc.). Have the principal examine weekly or bi-weekly progress reports and discuss his suggestions with the teachers. The principal would praise teachers adequately for progress. The principals would visit each class at least twice a week. A control group would be used with a procedure similar to that in Project 3.3.4.2.

Program 3.3.5: Increasing Teacher Participation -- Increase Teacher Participation in the Design of Inservice Training Programs.

This program is based on the premise that the processes by which teacher improvement programs are established should be examined in relation to their effectiveness.

Project 3.3.5.1: Provide Teachers With Release Time to Design, Supply, Utilize, and Govern Teacher Renewal Centers and to Develop Procedures for Assessing Changes in Teaching Skills and Teacher Satisfaction Which May Result.

Project 3.3.5.2: Develop Procedures to Evaluate Changes in Teacher Performance Resulting From Sabbatical Leave Programs.

Project 3.3.5.3: Compare Changes in Teacher and Student Performance When Inservice Training Programs Are Selected or Designed by the Administration With Changes Resulting From Programs When Goals and Methods Are Selected or Designed by Teachers.

Program 3.3.6: Teaching Self-Control -- Develop a Behavioral Self-Control Skills Training Program for Teachers and Students.

Behavioral self-control refers to the skills of self-management developed through behavior analysis methods. More specifically, self-control is a set of human actions which enable persons in a given situation to increase the frequency of desirable but previously infrequent behavior. Thus, a choice situation is involved. Both teachers and students and both preschool and elementary school settings are included in this discussion.

The notion of self-control has often been conceptualized as a personality trait ("willpower") or characteristic possessed by some and lacking in others. Recently, behavioral investigators have instead suggested that self-control can be viewed as a complex pattern of internal and external actions learned from experience. A further distinction between self-controlling actions and behavior to be controlled has called attention to the need to identify the components of self-controlling skills and to devise techniques for training persons in such skills (Kanfer and Phillips, 1970; Thoresen and Mahoney, 1974). One model of self-control has identified self-observation, environmental planning, and behavioral programming as the major components in self-control (Mahoney and Thoresen, 1974).

Numerous case studies and group experiments have examined specific features of self-control (Thoresen and Mahoney, 1974). Some studies have looked at the effects of self-observation and self-reinforcement on elementary school students in classrooms (e.g., Bolstad and Johnson, 1972; Drabman, Spitalnik and O'Leary, 1973).

The vast majority of successfully controlled studies have been conducted in laboratory settings. The need at this point is for controlled single case and group studies that (a) further examine the effects of self-controlling actions on teacher and student behaviors and (b) evaluate self-control training programs for young children and their teachers. To date, few training studies have been conducted (Hendricks, Thoresen, and Hubbard, 1974). Given the major emphasis on personal responsibility and individual autonomy for teachers and students offered by major educational approaches, the value of self-control skills training is extremely high.

Project 3.3.6.1: Develop and Evaluate the Effects of Self-Contracting Training for Elementary School Teachers. At present there is no evidence from controlled studies on the effects of systematic training and utilization of self-contracting by teachers. Self-contracting represents a major self-management strategy whereby the individual must use such skills as self-observation, self-reinforcement, self-punishment, and self-modeling (Thoresen and Mahoney, 1974). As such it offers a potentially powerful means by which teachers can alter a tremendous variety of their own actions in everyday-settings, such as the classroom. This project will first develop a system for training teachers in the skills needed in self-contracting. The project will also evaluate the short-and long-term effects on students and teachers of the teacher's use of self-contracting.

The project's objectives are to (a) develop a self-contracting training program, (b) assess the immediate effects of self-contracting; and (c) assess its long term effects.

APPROACH 3.4

GOAL SETTING PROCEDURES -- DEVELOP, THROUGH EMPIRICAL RESEARCH, SYSTEMATIC PROCEDURES THAT CAN BE USED TO DEFINE THE GOALS AND OBJECTIVES OF EDUCATIONAL PROGRAMS

The educational program of the public schools (and other educational agencies) suffers from inadequate definition of its goals and objectives. This deficiency makes it difficult, if not impossible, to establish criteria of program effectiveness and results in a serious lack of accountability at all levels in education. Without clear objectives it is not possible to conduct a coherent program of inservice or preservice training for teachers and teacher-support personnel to differentiate effective from ineffective procedures to assess the merits of proposed or achieved change or to support or refute the contentions that the schools are irrelevant (Jencks, et al., 1972), or even harmful (Holt, 1964; Goodman, 1964; Silberman, 1970; and others).

A goal statement describes an intended and desired outcome. A definition of the desired outcome also provides the primary criteria for determining and describing approximations to that outcome. Without the referent that such a statement provides, any evaluation can be dismissed as irrelevant to the "real purpose" of the school or educational program. On the other hand, if such a statement is appropriately constructed, it can serve as a basic reference point against which the current status and the progress of a program may be judged. Such judgments may be made, however, only if the goal is stated in terms that are reliably measurable (Glass et al., 1973).

The requirement that educational goals be stated in measurable terms does not restrict or in any way prescribe the content of the goal. The relative absence of clear statements about the humanistic and affective objectives of education in the behavior analysis field may be a comment on communications barriers within the broad field of education, but it does not indicate that objective goal statements are incompatible with humanistic or affective goals. A goal statement that is found to confine the educator too much is a poorly conceived statement and should be revised.

In view of the central importance of educational goal statements, it is equally important that attention be given to developing procedures that can be used to formulate them. The questions of who should formulate such statements, and how, deserve experimental analysis.

The terms in the title of the approach may be defined as follows: A systematic procedure is one that is defined and described in sufficient detail that it can be faithfully replicated by a certified teacher or others of comparable training and background. Goals and objectives are used here in the more general, popular sense, rather than according to the more precise usages suggested by Gagne, Mager, Resnick, or others. An educational program refers to the activity of a classroom, a school, a school district, a college, or any institution that formally assumes teaching responsibility.

A variety of attempts to implement and to evaluate educational intervention programs during the past decade, including EPDA (Educational Personnel Development Act), ESEA (Elementary and Secondary Education Act), Head Start, Follow Through, have been either successful or unsuccessful, depending on the private or post hoc criteria of various commentators. These discrepancies in judgment have served to highlight the need to state definitions of goals and objectives before the programs are initiated. At the same time it has become evident that relevant goal statements must reflect the greatest possible collaboration of all participants in the program -- educators, parents and children.

The development of Policy Advisory Committees (PACs) within Head Start, Follow Through, and, most recently, Title I of ESEA, has offered a partial solution to the problems generated by vague or missing goal statements. At their best, they have provided encouraging demonstrations of the advantages of shared goals. These bits of encouragement are largely anecdotal, however, and appear to be the product of accidents of good leadership rather than uniform procedure. Nevertheless, the occasional successes of these programs strongly suggest the possibility that standard procedures can be developed to bring the advantages of collaborative goal setting within reach of all educational programs.

Specific goal setting is a hallmark of behavior analysis. The initial statement of a final objective (terminal behavior), coupled with continuous measurement, provides an ongoing description of progress (or the lack of it) toward that objective. The procedures for developing useful goal statements are relatively standard and well understood by behavior analysts, but only for rather small scale activities that involve relatively few participants. The extent to which current procedures can be applied to the very large scale requirements of entire educational programs is an empirical question. The following programs are recommended as ways of seeking answers to that question.

Program 3.4.1: Identifying Participants -- Develop Procedures to Identify Those Who Consider Themselves Participants in Various Types of Educational Programs.

Program 3.4.2.: Goal Selection by Participants -- Develop Procedures That Permit Participants to Select General and Individual Goals.

The objectives of this program are (a) to protect the diversity, novelty, creativity of all participants (i.e., permit risk-taking); (b) to design guidelines that stimulate positive goal statements rather than negative ones; and (c) to devise goal statements that include process as well as outcome descriptions.

Project 3.4.2.1: Design Procedures to Resolve Conflict When Inconsistent or Incompatible Goals are Selected by Different Participants.

Project 3.4.2.2: Assemble a Taxonomy of Possible Goal Statements for Various Programs. Then Develop a List of Options From Which Participants May Select.

Program 3.4.3: Setting Humanistic Goals -- Develop a Conceptual and Empirical Analysis of the Goals and Procedures of Humanistic Education.

The goals and objectives of humanistic educators, although worthy of careful consideration, have been stated in a vague, abstract fashion that makes empirical evaluation extremely difficult (e.g., Thorasen, 1973). On the other hand, behavioral investigators have developed a powerful technology for behavior change which could be applied to foster the "personal growth" of students. Obviously, a synthesis is called for -- one that will bring together the means of behavior technology and the ends or goals advocated by humanist scholars.

Humanistic education generally refers to the rationale and methods which emphasize the "personal growth" and affective-emotional development of the student. Conceptual analysis refers to the study of the theory, concepts, rationale, and methodology of humanistic education, including its basic assumptions. Empirical stresses the controlled, experimental study of procedures used in humanistic education.

The personal development of each student has long been a major goal of education (e.g., Dewey, 1938). Recent critics of education (e.g., Holt, 1964; Silberman, 1970) have cited the failure of public education to deal with such development. Humanistic educators (Brown, 1969; Weinsteen and Fantini, 1970; Patterson, 1973) have argued that "personal growth" can be best accomplished by means of affectively-oriented curriculum materials, empathy-sensitivity communications training, Gestalt training and other procedures. Teacher training programs have been developed to provide teachers with the skills presumed to be necessary to carry out an affective education program in the classroom (e.g., Brown, 1969).

Currently there is a considerable literature on the effectiveness of various behavioral methods (e.g., Bandura, 1969; Kanfer, 1973). There is also a large body of conceptual literature concerning humanistic education (see Patterson, 1973). To date, however, little work has been done to bring a controlled empirical emphasis to the work of

humanistic educators. Thoresen (1973) has suggested that the recent work in behavioral self-control and the well established single-subject methodology of behavioral research workers offers great promise for humanistic educators, especially those concerned with evaluating and improving their programs.

Project 3.4.3.1: Translate Humanistic Education Goals for Teacher Training Into Behavioral (Performance) Terms. One of the first steps in making behavior analysis and technology available to achieve the goals of humanistic educators is to clarify what those goals represent. Thoresen (1973) has suggested that it is possible to translate the vague and abstract goals of humanists into observable performance terms. Such an effort requires careful attention, however, to semantic and philosophical considerations. Further, the historical context from which various goals emerged must be considered in any effort to translate vaguely stated objectives. With data from this project, several opportunities would be created whereby behavioral techniques can then be applied to produce the performance-stated objectives. Process measures focus on the means by which one obtains an outcome or goal.

One hallmark of the behavior analysis approach has been its emphasis on repeated measures of observable behavior. Generally, these measures have consisted of the frequencies of specific types of academic and social behavior. A tactical strategy was initially adopted in which researchers measured observable behavior of teachers and children (Bijou, 1965) because it was felt that directly observable events had maximal potential for allowing one to produce significant behavior change. Between 1965 and 1970, prototypes of observational systems were used in public schools by Becker and his colleagues at Illinois (Becker, Madsen, Arnold and Thomas, 1967; O'Leary and Becker, 1967) and by investigators at the University of Kansas (Hall, Lund and Jackson, 1968; Bushell, Wrobel and Michaelis, 1968). At about the same time, evaluations of behavioral change programs were being made by analyzing achievement and rating data (Wolf, Giles and Hall, 1968; Keller, 1968).

The behaviors deemed appropriate for alteration are currently shifting. One cause of the shift has been the interest in changing educational climates through such approaches as the open classroom and the tutorial college environment. Another cause has been the interest in more complex forms of behavior, such as creativity (Goetz and Baer, 1973) and peer-interaction (Quilitch and Risley, 1973).

During the past five years research has been begun on the problems of measurement and the development of new assessment instruments, but such research is in its preliminary stages. Further, this research has only started to make significant contact with traditional measurement methodology and its models of statistical analysis, reliability, attitude scaling, and validity, such as construct and concurrent validity. For example, relations between ratings of behavior and frequency counts of behavior are being studied. Despite the small number of investigations

of methodology, research has revealed serious problems in observation, such as the reactions of teachers and students when observers are in the classroom, the influence of observer expectations on global ratings of classroom behavior, and the need to train and retrain observers so that they use consistent frames of reference in making their observations (O'Leary, 1974). Several authors have proposed statistical models for individual subject designs (Chassen, 1967; Mitchell, 1969; Gentile, 1972), but these designs often violate assumptions of the basic statistical models from which they are derived (Thoresen and Elashoff, in press; Hartmann, in press). The behavior analysis field has produced some significant treatments on such methodological problems as reliability (Johnson and Bolstad, 1973; Winkler, 1970), but such research has received attention from relatively few investigators. Also, while consumer-satisfaction indices of the value of educational programs have been used by several investigators (e.g., Fixsen, Phillips, Phillips, and Wolf, in press), much more research is needed to enable investigators to use such indices in decision making. Finally, means of enabling consumer groups to use consultants to build their own satisfaction indices need to be explored.

The project would be carried out in the following sequence of steps:

1. Examine humanistic literature, visit humanistic teacher education programs, consult with philosophers and historians of science.

2. Prepare a tentative draft of a monograph on the analysis of the goals of humanistic training programs and their translation into behavioral-performance terms.

Program 3.4.4: Goal Measurement -- Devise Methods for Creating Acceptable and Reliable Measures of Attainment of Participant-Selected Goals.

Note: It may turn out that the precision of a measure will vary inversely with the size of the program; i.e., system-wide goals may need to have measures that are easily used and practical to avoid retreat back to standardized tests.

Project 3.4.4.1: Develop Acceptable Measures of Achievement of More Abstract Goals Such as Creativity, Initiative, Problem Solving.

Program 3.4.5: Tests of Planned Variations -- Implement Model Programs in Various Types of Educational Programs.

Project 3.4.5.1: Empirically Evaluate Differences in Effects (Outcomes) When Goals Are Set by "System" and When Set by Participants.

Project 3.4.5.2: Test Goal Setting Procedure in Various Settings in Terms of Whether the Procedure Can Be Used Appropriately and, if so, in Terms of the Desirability of its Effects.

APPROACH 3.5

PARENT EDUCATION -- DEVELOP A COMMUNITY EDUCATION TRAINING PROGRAM FOR PARENTS

This approach was not developed by the Panel. It was a recurrent topic, however, and is included here primarily to emphasize the Panel's conviction that the education of children is not a school-bound process. A variety of parent education programs that would greatly expand the educational experience of school-aged children could be fashioned.

APPROACH 3.6

PROCESS AND OUTCOME MEASURES -- DEVELOP AND EVALUATE MEASURES OF TEACHING PROCESSES AND OUTCOMES

Measures of the teaching process can be made by means of ratings, direct observations, and achievement data which reflect internal cognitive and emotional variables as well as observable social and academic change. Process measures focus on the means by which one obtains an outcome or goal.

One hallmark of the behavior analysis approach has been its emphasis on repeated measures of observable behavior. Generally, these measures have consisted of the frequencies of specific types of academic and social behavior. A tactical strategy was initially adopted in which researchers measured observable behavior of teachers and children (Bijou, 1965) because it was felt that directly observable events had maximal potential for allowing one to produce significant behavior change. Between 1965 and 1970, prototypes of observational systems were used in public schools by Becker and his colleagues at Illinois (Becker, Madsen, Arnold and Thomas, 1967; O'Leary and Becker, 1967) and by investigators at the University of Kansas (Hall, Lund and Jackson, 1968; Bushell, Wrobel and Michaelis, 1968). At about the same time, evaluations of behavioral change programs were being made by analyzing achievement and rating data (Wolf, Giles and Hall, 1968; Keller, 1968).

The behaviors deemed appropriate for alteration are currently shifting. One cause of the shift has been the interest in changing educational climates through such approaches as the open classroom and the tutorial college environment. Another cause has been the interest in more complex forms of behavior, such as creativity (Goetz and Baer, 1973) and peer-interaction (Quilitch and Risley, 1973).

During the past five years research has been begun on the problems of measurement and the development of new assessment instruments, but such research is in its preliminary stages. Further, this research has only started to make significant contact with traditional measurement methodology and its models of statistical analysis, reliability, attitude scaling, and validity, such as construct and concurrent validity. For example, relations between ratings of behavior and frequency counts of behavior are being studied. Despite the small number of investigations of methodology, research has revealed serious problems in observation, such as the reactions of teachers and students when observers are in the classroom, the influence of observer expectations on global ratings of classroom behavior, and the need to train and retrain observers so that they use consistent frames of reference in making their observations (O'Leary, 1974). Several authors have proposed statistical models for individual subject designs (Chassen, 1967; Mitchell, 1969; Gentile, 1972), but these designs often violate assumptions of the basic statistical models from which they are derived (Thoresen and Elashoff, in press; Hartmann, in press). The behavior analysis field has produced some significant treatments on such methodological problems as reliability (Johnson and Bolstad, 1973; Winkler, 1970), but such research has received attention from relatively few investigators. Also, while consumer-satisfaction indices of the value of educational programs have been used by several investigators (e.g., Fixsen, Phillips, Phillips and Wolf, in press), much more research is needed to enable investigators to use such indices in decision making. Finally, means of enabling consumer groups to use consultants to build their own satisfaction indices need to be explored.

Program 3.6.1: Measures of Student and Teacher Behavior -- Develop Systems Which Measure Student and Teacher Behavior in a Variety of Educational Settings.

The measures by which one judges the effectiveness of a program are central to all research and service needs in education. Consequently, there is an imperative need to develop systems which measure teacher and student behaviors related to students' social and academic skills. Such measures should be made in a way that will allow the researcher to evaluate behavior systematically and give teachers immediate feedback regarding themselves and their pupils. Several observational

schemes for analyzing student-teacher interactions are available, but many of these are too complex for practical training purposes. New, more practical systems might be developed through the following sequence of steps:

1. Identify the key student and teacher behaviors to be measured.

2. Determine the degree of consensus on these behaviors by comparing them with as many current observational schemes as possible and discussing the schemes with teachers, teacher supervisors and researchers.

3. Define behavioral codes so that they allow adequate reliability of observation to be attained quickly.

4. Examine the sensitivity of the measures to change in behavior and setting.

This sequence of steps needs to be carried out before accountability measures are fully developed (see Approach 3.7). This program, regarded as critical to the entire approach, could be carried out as a series of projects at the preschool, elementary school, secondary school, and college levels.

Project 3.6.1.1: Identify Behavioral Measures for Evaluating the Effectiveness of Inservice Teacher Training Workshops. At present, inservice training for teachers is usually evaluated subjectively, by participants writing open-ended reports or completing checklists. Occasionally a checklist relating to teacher performance may be completed directly in the classroom. Direct behavioral measurement of short- and long-lasting changes in teachers' classroom performance has seldom been performed.

To carry out this project, the Panel suggested the following steps:

1. Survey the field to identify direct and indirect behavioral measures of teacher performance.

2. Check for evidence on the reliability of the measures.

3. Share ideas for new direct measures from behavior analysis: time sampling, social interaction, questioning methods, etc.

4. Design measures and techniques that are practical and feasible.

5. Carry out a reliability assessment with repeated independent scoring.

6. Estimate the validity of the measures by having major groups of people involved sort or rank the teachers to obtain a criterion measure for use in validation; and

7. Determine reliability and validity coefficients, including test-retest coefficients.

Project 3.6.1.2: Develop a Procedure for Measuring Teacher Performance in the Classroom Which Will be Useful in Improving Teaching Effectiveness. This project will first involve evaluating all existing procedures for measuring teacher performance which have been used in a cross-section of school systems. Second, the project entails developing a direct observational procedure for recording aspects of teacher performance, a procedure which requires little time. Third, the project requires using the procedure in the same cross-section of school systems to determine its usefulness in evaluating teacher performance. The following factors will be considered in developing an observational procedure:

1. Identification of the children contacted by the teacher.
2. Frequency of contacts.
3. Content of contacts.
4. Positive or negative nature of the contact.
5. The responses elicited from pupils.

The following possible method was suggested to conduct this project: 1) Select a sample of school systems from which to collect information; 2) Collect their current procedures for measuring teacher performance; 3) Evaluate each procedure in terms of its objectivity, conciseness, and validity in evaluating a teacher's performance (validity criteria still undeveloped); 4) Develop a procedure that meets the above criteria; 5) Utilize the procedure in the sample systems; 6) Revise as necessary; and 7) Use the procedures across systems to evaluate teacher performance in the classroom.

Program 3.6.2: Consumer Satisfaction Measures -- Develop Systems for Measuring Consumer Satisfaction With Educational Programs.

If educational programs are effective in producing academic and social gain, but are nonetheless disliked by parents (e.g., because they feel too much pressure is placed on a child), the programs will probably not endure. It is thus suggested that consumer satisfaction indices be used as one measure of the value of a program. Clearly, however, such indices should be seen as measures which may most profitably be employed after some initial evaluation of the effectiveness of a program.

Project 3.6.2.1: Develop a Technology for Measuring Consumer Satisfaction With Educational Programs. The objectives of this project would be to develop a technology for (a) designing, evaluating, and using consumer satisfaction instruments in programs involving teaching as behavior analysis; and (b) collecting, analyzing, and utilizing the information from such instruments. One possible method for carrying out this project would consist of the following steps:

1. Develop a procedure for identifying consumers.

2. Develop a procedure for identifying the relevant dimensions on which the program should be evaluated by each group of consumers.

3. Develop a procedure for identifying the appropriate technique for assessing the satisfaction of each group of consumers.

4. Develop procedures for collecting data by means of the techniques identified in Step 3.

5. Revise data collection procedures as necessary.

6. Replicate system with several programs and continue to revise until it proves to be functional through a sequence of several programs.

Program 3.6.3: Measures of Self-Control and Affect -- Develop Measures of Self-Control and Affective and Emotional Responding.

A wide variety of educators and psychologists consider self-control to be an area worth significant research attention (Bandura, 1969; Kanfer, 1973). A few clear inroads have been made in the application of self-control procedures in the classroom to children with behavior problems (Glynn, 1970; Drabman, Spitalnik and O'Leary, 1973). But applied research with students with direct relevance to classroom behavior has been meager. The affective responding of students has been almost totally ignored in the behavior analysis field. New measures of affective responding are needed (e.g., measures of: tardiness, absenteeism of students, involvement in extra school activities, and self-reported feelings about school). A general rubric of approach and avoidance behaviors might serve as a general category system for building affective measures.

Project 3.6.3.1: Develop Measures of Self-Control of Children. There is extensive agreement that one does many things to control his or her own behavior, but many of these are not currently readily measurable. Interest in self-control is increasing in many areas of psychology, especially clinical and developmental psychology, but the variables of interest to developmental and clinical psychologists often have little direct bearing on classroom concerns. Some studies of self-instruction, self-recording, self-evaluation, and self-reinforcement have been carried out, but only a few of each of these kinds of studies have dealt with classroom behavior.

One possible method for conducting this project would consist of the following steps:

1. Cataloging existing measures of self-control with clear definitions of various types of self-control; e.g., look at current self-recording systems for measuring overt behavior, thoughts, and feelings.

2. Analyze existing self-control literature for possible methods of estimating the reliability of self-control measures (e.g., intermittent spot checks, peer checking with subject consent, EMG records of subvocal speech).

3. Begin the development of new measures of self-control which seem to have some potential for changing a variety of classroom behaviors. (For example, at the high school and college levels one might begin to measure how individuals use statements about themselves to improve their social functioning. At the preschool and elementary level one could begin to measure the effects of systematic programming of self-evaluative and self-reinforcing behavior on academic skills, such as creativity and writing.)

Program 3.6.4: Post-Elementary School Measures of Effect -- Develop New Measures of the Effectiveness of High School and College Education.

In addition to achievement tests and attitude ratings, measures of other responses to instruction need to be obtained. For example, Personalized Systems of Instruction (PSI) are being used widely across the country, but relatively traditional measures of the effects of college instruction have been used to evaluate such courses. A variety of new measures could be developed, such as the number of psychology courses taken beyond the introductory level, instructor costs related to effectiveness, drop-out rates of students with various initial skill levels, attitudes of proctors, and amount of study time.

Program 3.6.5: Problems of Reliability and Validity -- Methodological Research on Problems of Reliability and Validity.

Reliability of observations has been a central concern in developing measures in the behavior analysis field, but there have been few systematic efforts to look at relationships among different ways of estimating reliability (Johnson and Bolstad, 1973). When direct observations are made in a classroom, one needs to know how long the observations should be continued in order to reach some accepted level of stability. Reactive effects of the reliability checker have been found by several investigators (Reid, 1970; Romanczyk, et al., 1973; Kent, et al., 1974), and this finding makes reports of very high reliability coefficients based on agreement per time interval somewhat suspect. Research is needed to compare different reliability estimation methods (e.g., agreement on occurrence per interval, Pearson product-moment correlations, phi coefficients, smaller/larger) with different types of data.

Valid data on observational assessment are also sorely needed. Research on relationships between observational data, achievement data, and rating scales should have high priority. Such validation is critical in enabling one to set goals, since an educational program should be directed toward changing key behaviors that are relevant to a number of

other behaviors. It may be unnecessary to attempt to directly change out-of-seat behavior if being out-of-seat is unrelated to attaining academic objectives (Ayllon, Layman, and Burke, 1972). Another example of this need for validation is found with "hyperactive" children: Unfortunately, there is no reliable observational system for distinguishing a child in the classroom who was referred for hyperactivity from a randomly selected same-sex child (Blundem, Spring, and Greenberg, 1974). It has been argued that approximately five percent of an elementary school population should be treated for hyperactivity or minimal brain dysfunction (Wender, 1971). Yet, until rating scales are validated against observational data, it seems that the label "hyperactivity" will be sorely misused. Children will receive medication because they represent a "disrupting" influence to the teacher but would not be judged hyperactive in many settings by a professional or a layman (Sroufe, in press).

Program 3.6.6: Analyses for Within-Group Designs -- Develop Data Analysis Methods and Research Designs for Single-Subject (Single-Group) Research.

The behavior analysis field was early characterized by strong reliance on single subject research. Yet there are no well accepted methods for analyzing data from individual subject designs. While there are increasing numbers of within-group design analysis-of-variance projects, there is a strong need for methods better than "eye-balling" for the comparison of baseline and treatment data. The general rationale here is that a set of statistical procedures for single-subject research (like those set forth by S. Siegel for group-design research) would be a critical addition to the literature. We also need comparisons of different ways of analyzing individual subject research in terms of decisions, error rates, confidence limits, cost and utility.

APPROACH 3.7

ACCOUNTABILITY -- DEVELOP AND TEST METHODS BY WHICH TEACHERS AND TEACHER-TRAINING INSTITUTIONS CAN MAKE THEMSELVES MORE ACCOUNTABLE FOR THEIR PERFORMANCE

Two terms used in the statement of this approach should be defined. The meaning of the term accountable is indicated in the following statement by Alkin and Baker (1973): "Accountability is a relationship in which the participants agree in advance to accepted specified rewards and costs on the basis of an evaluation of specified ends" (pp. 245-246). Performance may include what the teacher does (process) and what effect it has on students and others (outcome).

Formal accountability procedures are used in various professions (e.g., the medical and legal professions) to assure quality performance of their members. Recently, through the Stull Act and the Rodda Act, the state of California has required that school districts institute accountability in regard to the performance of elementary, secondary, and community college teachers and administrators (Shannon, 1973). Formal accountability procedures have also been developed in applied behavioral programs. Evidence thus far suggests that these procedures can result in increased effectiveness and "consumer" satisfaction (Fixsen, Phillips, Phillips, and Wolf, in press; Bushell, personal communication). This result might be expected, for a wealth of evidence has shown the importance of differential feedback or consequences in effecting improved human competence (Bandura, 1969; Panyan, Boozer and Morris, 1970).

Program 3.7.1: Preconditions for Accountability -- Identify and Develop Ways to Create Preconditions for Accountability.

The purpose of this program is to identify and develop ways to create preconditions for the development, testing, and implementation of methods by which teachers and teacher-training institutions can make themselves more accountable for their performance.

In general, essential preconditions for accountability by teachers and teacher-trainers do not currently exist. For example, it is not reasonable to hold a teacher responsible for achieving learning outcomes unless it has been shown that the program provided for the teacher is capable of achieving those outcomes under proper management (Alkin and Baker, 1973).

On the other hand, accountability procedures could under certain conditions help teachers and training institutions. Therefore the identification and development of ways to create preconditions for accountability are essential.

The concept of accountability is in many ways analogous to that of behavioral contracting. Both concepts involve reciprocal negotiations, making explicit the responsibilities of each party and the consequences contingent on meeting those responsibilities (Stuart, 1971). An analysis of the procedures used in arranging successful contracts has resulted in some specification of useful pre-conditions for making such arrangements (Jayaratne, Stuart, and Tripodi, 1974). Similar analyses of successfully implemented accountability contracts should likewise result in the specification of optimal pre-conditions for accountability arrangements.

To identify and then develop the preconditions for accountability, the following steps are suggested:

1. Determine who needs to be involved in the cooperative establishment of functional accountability procedures.

2. Develop procedures for the cooperative establishment of performance goals to be used in accountability procedures.

3. Develop measures for assessing whether conditions are adequate and acceptable for instituting accountability.

4. Determine conditions necessary for a willingness to adopt and the ability to carry out accountability procedures.

5. Develop disseminable procedures for creating necessary preconditions to accountability when they are lacking.

Project 3.7.1.1: Evaluate the Effects of Compatibility Between Accountability Measures and the Content of Teaching. If an accountability system is to operate effectively, it should evaluate how effectively the teaching is accomplishing its goals. If an assessment tool is evaluating outcomes other than the desired and intended outcomes, the teacher or trainer cannot reasonably be held accountable on the basis of that assessment tool. In addition, incompatibility between accountability measures and the content of teaching eliminates the formative function of the feedback system. In that event the measures will not provide the teacher or trainer with feedback that will be useful in remedying performance deficiencies (Alkin and Baker, 1973).

The effects of incompatibility between accountability measures and the content of teaching can be estimated in a correlational study, but it can also be done in an experimental fashion in the following way: measure both the compatibility variable and certain outcome measures across several school systems, grade levels, school buildings, teachers, teacher-training programs, or trainers; then, in multiple-baseline fashion, reduce the incompatibility in one after another of these cases while continuing to monitor the outcome variables.

Project 3.7.1.2: Test the Effects of Certain Components of an Accountability System on the Willingness of Various Groups to Accept Them Verbally. In order to have an accountability system, it is necessary to have all involved parties agree to the conditions of the system. Therefore an empirical analysis of the acceptability of various potential components of such systems is critical.

This empirical analysis could be made directly through questionnaire survey. The survey could be followed by an analysis of the correlation between survey response and acceptance of the component of the system in negotiations.

Variables that might be manipulated in the system proposal might include (a) the degree to which each teacher or trainer could individually influence the specific contingencies and consequences supplied to him, (b) the particular consequences or their magnitude, and (c) the particular measures on which the contingencies are based.

Project 3.7.1.3: Determine the Influence of Such Variables as Type of Student, Size of Class, or Availability of Teacher-Support Personnel on the Readiness of Teachers to Accept Accountability. This project, unlike Project 3.7.1.2 above, deals with the variables that are outside the accountability system itself, yet are capable of having great impact on the measures used to evaluate the teacher or trainer. As Alkin and Baker stated, "It is impossible to discuss anticipated outcomes without using school and instructional constraints as a frame of reference" (p. 246).

This project will probably need to be done as a correlational study, relating teacher's acceptance level to student type, class size, etc.

Project 3.7.1.4: Determine What Characteristics Various Personnel Would Give an Accountability System if They Were the Sole Determiner of it. Administrators, teachers, trainers, parents and trainees would probably include different components and give them different emphasis. Knowledge of what characteristics each party in the accountability system would find acceptable would help in the design of mutually satisfactory systems.

The method to use for this project would be the same as for Project 3.7.1.3 above.

Program 3.7.2: Accountability Criteria -- Develop Procedures to Establish Accountability Criteria Appropriate to Various Settings and Conditions.

There is considerable public sentiment in favor of the accountability of teachers and school systems. To make any accountability system optimally fair to the teacher or trainer, as well as to the "consumer" (student, trainee, parents, administration, public), assessment tools must be adequately varied, valid, reliable, and sensitive. At the same time, the assessment procedures must be kept within feasible economic

limits. Thus the process of selecting acceptable assessment tools will require considerable negotiation among the parties involved. Then the task will require testing an agreed-upon set of tools, re-evaluation of their adequacy, revision, and recycling of the whole process.

The cooperative selection of assessment tools by everyone concerned with the accountability process (teachers, parents, school boards, administration, and students) involves the cooperative establishment of goals (see Approach 3.4) and the selection of measures to evaluate the extent to which those goals are met (see Approach 3.6).

Assessment tools for evaluating processes and outcomes in teaching and training will certainly be concerned with assessing effectiveness. In addition, assessments might also be concerned with various consumers' preference for, and satisfaction with, those outcomes and processes. Measurement procedures have recently been developed for evaluating consumer preference for (Phillips, Phillips, Wolf, and Fixsen, 1973) and satisfaction with (Fixsen, Phillips, Phillips, and Wolf, in press) processes and outcomes. These procedures can serve as models for expanded work in this area.

It has been suggested that the establishment of criteria for acceptable performances on each selected assessment tool requires taking into account the limitations imposed by situational factors (e.g., curriculum used and composition and size of class -- Alkin and Baker, 1973). The determination and measurement of such enviromental constraints might well utilize environmental scales such as those developed by Moos (1974).

Standard procedures will first have to be delineated for the selection of appropriate and acceptable outcome and process assessment tools. Similar standard procedures will be needed for the establishment of acceptable criteria for each tool. Then the extent to which the standard procedures can be used reliably and successfully in a variety of settings and conditions will need to be evaluated. Multiple baseline designs could be used in the systematic evaluation of the replicability of the procedures.

The objectives of this program are (a) to devise economically feasible assessment tools; (b) to set criteria of performance on these tools that are fair to all parties involved; and (c) to provide for the continued evaluation and refinement of such tools.

In the process of searching for appropriate assessment tools it is likely that the need for more and better tools will become evident. Approach 3.6 should be responsive to this need. As assessment tools are selected, criterion levels will be established. Mechanisms to adjust the criteria on the basis of experience are essential.

Project 3.7.2.1: Assemble a Taxonomy of Assessment Tools to Provide Options to Those Negotiating the Establishment of an Accountability System (Related to Project 3.4.2.2). The selection of adequately varied, valid, reliable, and sensitive assessment tools would be facilitated by construction of a list of possible tools, along with descriptions of their characteristic emphases, strengths, and weaknesses.

Project 3.7.2.2: Develop Procedures for Establishing Fair Performance Criteria on Each of the Selected Assessment Tools. Fair performance criteria could generally be established by allowing the parties in various accountability systems to set, continually evaluate, and reset criteria until they are satisfactory. Correlations between situational factors and eventual criteria could then provide information on appropriate criteria in varying situations. Ideally, some general measurement instruments could be devised to allow relatively accurate matching of criteria to teacher and situational variables.

Project 3.7.2.3: Test the Effectiveness of Procedures for Selecting Assessment Tools and for Establishing Performance Criteria in Various Settings and Conditions.

Program 3.7.3: The Use of Consequences -- Develop Procedures to Provide Different Consequences for Different Performances.

After agreement has been reached on the selection of assessment tools and criteria, it will be necessary to determine a set of agreed-on contingencies that provide appropriate benefits for criterion performance. Work in the area of behavioral contracting has demonstrated that mutually acceptable contingencies and consequences can be negotiated (Stuart and Lott, 1972). Further such agreements need to be open to re-negotiation if they are to continue to be acceptable and effective (Stuart and Tripodi, 1973).

Project 3.7.3.1: Develop a List of Acceptable and Effective Consequences That Could be Used in Accountability Systems.

Program 3.7.4: The Effects of Accountability -- Assess the Effects of Accountability Procedures on Various Members of the School and Community.

The assessment of the effects of accountability systems should not be restricted to only those measures that are already part of the accountability system. Assessment can be made of indirect effects. It can be made with greater frequency. It can involve more sensitive measures as a check on the validity of the accountability measures. It can involve longer term assessment. Procedures designed to bring about a specified outcome often unforeseeably effect other outcomes. Sometimes these "side effects" are desirable and sometimes undesirable

(Risley, 1968; Sajway, Twardosz, and Burke, 1972). Increasing attention is being paid to the problem of side effects and to the need for collecting diverse outcome measures over the long term (Baer, 1974; Willems, 1974).

Measures of the effects of accountability systems might include: measures of the personal and social development of students; the degree of risk-taking by teachers; teacher and administrative morale; the breadth of instructional objectives; teacher willingness to experiment with instructional strategies; staffing patterns; and educational roles. The effects on consumer satisfaction with the educational system might also be evaluated.

The objectives of this program are (a) to assess the effects of installing an accountability system; (b) to compare the different effects obtained with different accountability systems; and (c) to encourage the development and use of resources that might improve teaching or teacher-training.

Project 3.7.4.1: Test the effects of installing an accountability system. It is important to determine the effects of installing an accountability system in a controlled setting before it is evaluated on a large scale. This kind of tryout will allow a determination of benefits and risks. The measures of effect and side effect should be sufficiently detailed and varied to provide a basis for modifying the system to correct for problems. A multiple-baseline introduction of the system across classes or schools should provide appropriate information for modification.

Project 3.7.4.2: Compare the Effects of Various Combinations of Variables Within an Accountability System Across Time and "Subjects" (teachers, courses, institutions, etc.)

Project 3.7.4.3: Test the Effects of Various Changes in Resources for Teachers or Trainers on Their Effectiveness Under a Particular Accountability System. Compare Resource Utilization With and Without Accountability.

Project 3.7.4.4: Assess the Effects of "Program Adequacy" on Such Variables as Teacher Satisfaction With an Accountability System. Program adequacy includes any aspect of the teaching environment other than the teacher, e.g., curriculum guides, teaching materials, space, equipment, time constraints, or administrative support.

Project 3.7.4.5: Assess the Effects of any Particular Accountability System on the Revision of Instructional Objectives. The revision variable could be measured in terms of time spent revising, demand for revising, or some quality of the objectives (specificity, measurability, length, number, etc.)

APPROACH 3.8

FUNDING PROCEDURES -- DEVELOP CRITERIA FOR THE FUNDING OF EDUCATIONAL RESEARCH WHICH AIMS TO ENSURE OUTCOMES OF DIRECT RELEVANCE TO TEACHERS IN ATTAINING THEIR INSTRUCTIONAL OBJECTIVES AND WHICH INCORPORATE PROCEDURES ACCEPTABLE TO THE COMMUNITY INSTITUTIONS INVOLVED

This approach assumes that methods of funding are amenable to experimental investigation and that certain factors related to funding may be crucial in determining the ultimate impact of the research. The Panel knows of no research that has experimentally evaluated the conditions of funding. Funding generally has been based on expert judgment and political priorities.

In addition to the ordinary research criteria of potential productivity and intrinsic merit, the involvement of the community that is the recipient of the research is a factor which has been severely neglected. Feedback systems could have significant impact on grant recipients regarding formulation of problems and methods of implementation and evaluation. Such systems have begun to influence behavior analysis projects (Fixsen, et al.) but have not been experimentally analyzed. Finally, while "consent" is a term currently in vogue, research concerning the people involved in the consent and dissent process is almost nonexistent.

Research programs aimed at aiding funding agencies in assessing research impact could include the analysis of factors such as:

1. The extent and degree of authority of various "principals" and participants in the proposal writing activity. (Who gets involved, when, how often, by what process, with what authority, etc.).

2. The methods by which feedback is handled (group process, authority figures, in writing, etc.).

3. The methods by which dissent is handled (assignment of limited authority to designated figures in groups; third-party arbitration; consensus; veto power; etc.).

Program 3.8.1: Effects of Various Funding Procedures -- Measure Selected Process Variables as a Function of the Method of Funding NIE Proposals.

It can be assumed that proposals, in order to be funded, will (a) deal with worthwhile concepts of some predictable and practical value; (b) present experimental designs of acceptable integrity; and (c) provide functional assessment procedures. In addition, however, although concepts, design quality, and assessment procedures are effective predictors of success, another set of variables must be considered in assessing the probable success of proposed projects. These variables deal with personnel and the success of the decision-making process.

More specifically, these variables are factors such as role of the persons involved in the proposed research project; their authority, frequency of involvement, kind of involvement, etc. Unfortunately, the literature reveals very little on which to base firm decisions for funding purposes. It is therefore suggested that these variables be introduced into research project specification requirements. Over time, the interrelationships of these variables should be measured with a view toward establishing their worth as predictors of project success. The matrix below suggests the variety of elements and their mix, as an illustration. Project writers should be required to select the appropriate process variables (Columns 2, 3, 4, 5) for all populations (Column 1). A rationale for the selected matrix should also be supplied. Subsequent to the assessment or as a prerequisite to the re-design stage, matrix components should be assessed as part of the assessment program. Mid-project modifications in the project might have an impact on project results. Central storage of matrix elements paired with final evaluations could produce the correlations that would make possible prediction of the success of projects and ultimately modify fund-seeking techniques.

SUGGESTED MATRIX OF INVOLVEMENT EXPECTATION

1 Population(s)	2 Project Stages	3 Authority	4 Time-Depth	5 Method
1. Effectors	A Formulation	I Consultation	a) Single Stage (Refers to Column 2)	aa) Election
2. Direct Targets	B Implementation	II Informational	b) Two Stages	bb) Random Selection
3. Indirect Targets	C Assessment	III Partnership (Implies Task Distribution)	c) Three Stages	cc) Total Population
	D Re-Design	IV Consensus-Veto	d) Four Stages	

SUMMARY

Panel 3 was aimed at applying the educational technique known as applied behavior analysis to the problems of improving teacher education and teaching effectiveness. Although applications of behavior analysis to teaching have a short history, their success to date has been encouraging. To build on that encouraging beginning, the Panel identified eight distinct but closely interrelated approaches.

The first approach called for using behavior analysis in preservice teacher education in three ways: increasing the amount of information trainees receive about behavior analysis and education, using behavior analysis techniques to improve the personal-social skills of trainees (i.e., to help trainees acquire better ways of dealing with personal stress and tension), and using behavior analysis teaching procedures to improve the instruction of trainees in other professional and general education courses, especially through expanding the use of personalized systems of instruction.

The second approach dealt with ways of analyzing systematically what is required to disseminate, implement, and maintain new educational programs and teaching practices.

The third approach dealt with systematic programs of inservice training and professional development for classroom teachers and teacher-support workers (e.g., psychologists, counselors, and principals). Seven programs outline a variety of ways in which basic reorganizations of school practice can be brought about to provide improved support for teachers as they work in their own classrooms.

The use of behavior analysis in developing clearly stated goals for educational programs was set forth in the fourth approach. Such objectives are fundamental to planning and program development. In this approach proposals are made for the design of educational goals through the collaboration of all persons who consider themselves to be participants in a program, i.e., of educators, students, and parents.

The fifth approach was concerned with the need for developing educational programs for parents.

The sixth approach was concerned with methodological problems of measurement and data analysis. The solution of these problems was considered essential to improving the contributions of behavior analysis to teaching and teacher education.

The seventh approach was concerned with accountability in education. The problems of avoiding dangers and capitalizing on potential advantages of such accountability would be attacked through specific steps outlined in this approach. The steps would be aimed at the development of accountability systems that are both fair and acceptable to teachers.

Finally, the eighth approach dealt with an experimental perspective on NIE's role as a funding agency. How programs are funded undoubtedly affects the outcome and success of those programs. It is recommended that NIE treat methods of funding as an independent variable to be manipulated so as to improve understanding of the effects of various funding strategies.

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APPENDIX

SOLICITED REVIEWS OF THE PANEL 3 REPORT

NOTE: At the conclusion of the Conference, the members of Panel 3 felt strongly that their report should be reviewed by eminent researchers in the field who were not at the Conference. The time press of the Conference created concern that the report could contain serious errors of omission or present a biased view of the field. Consequently, the Panel submitted several names to NIE and asked that reviews of the Report be solicited.

The attached reviews were, necessarily, written under severe time constraints and without extensive orientation as to the nature and implications of the Conference (even the preface material of the report was not available to the reviewers). Because they constitute an extension of the perspectives available within the Panel itself, these reviews make a unique contribution to the substance of the report.

TEACHING AS BEHAVIOR ANALYSIS: A REVIEW

by W. Stewart Agras, M.D., Editor
Journal of Applied Behavior Analysis
Professor, Department of Psychiatry
and Behavioral Sciences
Stanford University

Unfortunately, the constraint of having to prepare a review within a very few days does not allow me to do justice to this most interesting and complex document.

The lag in time between the development of an experimental program in the laboratory and its widespread application is of concern to a number of service professions, but particularly, to education, clinical psychology, social work, and medicine. Equally problematic is the maintenance of the quality of such innovative programs once they are widespread, a question which involves continuing education of established professionals and administrators, ongoing objective review of the goals and quality of programs, and community accountability.

The authors implicitly suggest that if applied research is to maximally benefit society, projects to be supported should fit within an overall program of interlocking research. Traditionally of course, progress in a field has depended upon the individual efforts of researchers coordinated by their interaction with other investigators and the developing literature in the field. I suspect that we shall have to mainly rely on such research for continued progress in the field of education; however, a program such as this can guide funding agencies to solicit work in critical areas. For example, it is no good developing effective teaching procedures without discovering how to train teachers to use the methods, and how to interest administrators and the public in supporting such efforts. This document outlines a sequence of investigations required to optimize education from a behavior analytic point of view, and hence provides a policy guide to funding agencies. Moreover, this overview of the field of enquiry should prove useful to researchers in planning their studies. In fact, this research plan should be relevant to other service professions such as medicine which faces similar problems, and I would hope with a National Health Service on the horizon, that those interested in clinical applications of medical research would read this paper.

It is always tempting of course, to look for weaknesses or omissions in master plans, although whether this is necessarily helpful is questionable. Nevertheless, let me raise two issues. There is no provision made in this document for the support of naturalistic studies of the spread of educational procedures. Identification of the key variables involved in this process might lead to the development of new methods to enhance the spread of effective procedures. Certainly, our present methods ranging from the inspirational lecture or workshop, through the professional journal, to administrative fiat seem insufficient.

Jones and Azrin (1) demonstrated the use of such a technique in a recent study of job finding. Using a survey, they found that a critical step in gaining employment was a "job lead" from friends or relatives who knew of a specific job opening, were often employed themselves in the same company, and who frequently influenced the hiring process. Jones and Azrin then experimentally manipulated this variable by making a monetary reward contingent upon a "job lead" which resulted in gainful employment for an unemployed study subject. This procedure was very successful and seems to be a more viable alternative, or at least an addition, to the usual procedure of training job seekers in job finding skills.

The second issue, worth considering, concerns the priorities of funding within the array of experiments presented in this document. Should funding start with Project 3.1.1 and progress forward, or is there some other way of proceeding? I believe that some attempt should be made to indicate priorities for support based upon an educated guess about the payoff for certain types of research projects.

Finally, a word of praise. The recognition in this document that a true behavior analysis must encompass those goals usually termed humanistic is most important. Making such goals objective, and therefore measurable, promises to open up new and exciting research opportunities, and to bring nearer to fruition the ideal motivating educational environment.

1. Jones, R. J. and Azrin, N. H.: Southern Illinois University and Anna State Hospital. An experimental application of a social reinforcement approach to the problem of job-finding. Journal of Applied Behavior Analysis, 6: 345-353, 1973.

TEACHING AS BEHAVIOR ANALYSIS: A REVIEW

by Sidney W. Bijou, Director
Child Behavior Laboratory
Professor of Education and
Psychology
University of Illinois

Thank you for giving me an opportunity to read Panel 3's report on Teaching as Behavior Analysis. I regret it came so late. I was forced to read it rapidly and to give it less attention than such an important report deserves. My notes are as follows:

1. Statement of Goal. In the limited time available for this review, I do not want to become involved with specific words and phrases but I think it is essential to say on page 1 that "applied behavior research involves the application of well-established principles and techniques. . ." It would also be helpful to have a statement following (ii) explaining the meaning of well-established principles. This would be (iii). Too many people are claiming that they are applying behavior analysis principles but are, in fact, applying their own idosyncratic notions, some pretty outlandish.

2. Approach 3.1: Preservice training. The ground is comprehensively covered on this topic. I have only two comments:

Project 3.1.2.2. A highly relevant reference is not mentioned: C. B. Ferster, A functional analysis of depression, American Psychologist, 1973, 28, 857-870.

Project 3.1.3.3. This needs more emphasis since it is a suggestion for correcting current ineffective practices. Not only should information from the field be used to improve trainee instruction but also to improve the trainee situations.

3. Approach 3.2: Dissemination procedures. This area is very cogent. It is traditional to assume that findings in research situations will automatically apply to field situations. This in-between research and implementation are imperative if the educational processes are to be improved as the result of sound research.

Project 3.2.2.1 and Project 3.2.2.2 are beautifully conceive

4. Approach 3.3: Professional development. This area of research is comprehensively considered. If sound research is conducted on each topic, the finding could lead to increased teacher effectiveness and a very much needed restructuring of all the roles associated with the teaching endeavor.

5. Approach 3.4: Goal-setting procedures. This important topic is also comprehensively covered but it does not clearly say that the basic concern is with curriculum construction and I believe it should. Furthermore, it does not emphasize clearly the need for research on the important process of decision making in curriculum construction. Program 3.4.2 and Projects 3.4.2.1 and 3.4.2.2 bear upon it. Finally, nothing is said about the goal of teaching each school enrollee to read, and to read in a way that is a positive experience for him. The latest news release cites statistics to show that "Johnny still can't read." I think one goal of teaching as behavior analysis should be to remove reading retardation and reading disability "in our time."

6. Approach 3.6: Processes and outcomes. This is definitely an important area of educational research for the future. The stress on measurement is commendable (Program 3.6.1) but the emphasis is on behavior. There is also need for the measurement of the child's situations, too, and preferably measurement in functional terms. Another point: Project 3.6.1.1 step 6 refers to a rank ordering procedure for a validity measure. Should not the criterion be the positive changes in the children's behavior? This same question pertains to Program 3.6.4, i.e., post-school measures would be most meaningful if they were in terms of observable and recordable changes in the students' behavior.

7. Approach 3.7: Accountability. This is a relatively undeveloped research area. Nevertheless, I believe all of the essential problems have been given careful consideration.

8. Approach 3.8: Funding procedures. I agree with the Panel that there is little or no research on evaluating the conditions of funding. I believe that NIMH has attempted to do something on this problem, but most of it is done for the purpose of justifying past expenditures. It would be refreshing to have some systematic research on the problem.

9. Overall impression: This is a comprehensive, clearly-written document. It is inspirational in the sense that the panelists can visualize the kind of studies that will lead to basic and lasting changes in the education of our children. It reflects the hard work, and the careful thinking of an obviously well-trained, dedicated group of people. They are certainly to be commended for producing such a carefully conceived set of recommendations.

TEACHING AS BEHAVIOR ANALYSIS: A REVIEW

by R. Vance Hall, Director
Juniper Gardens Children's Project
Professor of Education and Human Development
University of Kansas

Thank you for sending me the statement generated by the NIE panel on Teaching as Behavior Analysis.

I understand that the statement was generated in a relatively short period of time and, as is mentioned in the text, that the various approaches were written by different panel members, returned for feedback, revised and added to. As would be expected, this process has resulted in some unevenness of treatment. Some redundancy is still apparent. However, it seems to me that the statement is an admirable effort and the panel is to be complimented on its work.

Some aspects of the statement were beyond the areas of my own expertise and current professional interest, for instance Project 3.1.2.2 on the development of techniques for the prevention and management of teacher depression and 3.1.2.3 for the self-control of insomnia. This does not mean, however, that I necessarily think that these areas are unimportant or that they should not be within the realm of the programs carried out. It does indicate that the panel members have attempted to include a broad spectrum of program areas and are not confining themselves to those which have already been researched or investigated. To explore some new frontiers is undoubtedly meritorious.

From my point of view the inclusion of a few such areas is adequately balanced by excellent coverage of most areas recognized by those in the field as important and in need of immediate attention. In fact, I find it rather difficult to fault the panel or to suggest areas that they did not touch upon. It is apparent the panel has succinctly outlined the areas of research which our staff at Juniper Gardens have projected as high priority items for our own future efforts. In a number of these we have in fact already undertaken preliminary steps to develop programs as in the area of the school principal and parent and paraprofessional training. I would surmise that almost any other person active in the field would also find that the panel has done a remarkable job of outlining program areas that need to be developed and evaluated.

I also liked the fact that the panel dealt with the need to work toward a rapprochement with humanistic goals and using a behavior analysis approach to making them more tangible and attainable.

It was also most encouraging that the panel reflected the move toward accountability and consumer satisfaction which is making itself felt in the field. This plus the emphasis placed on evaluating the effects of programs over the long term as well as the short term showed that the panel was concerned with the obligation that behavior analysis has to society to produce results that society recognizes as worthwhile and in the best interest of its children.

In summary, it is easy for me to endorse the panel statement. I shall look forward to whatever opportunity avails itself to me to assist in developing and carrying out programs such as those that have been outlined.

TEACHING AS BEHAVIOR ANALYSIS: A REVIEW

by B. L. Hopkins, Director
John T. Stewart Children's Center
Professor of Human Development
University of Kansas

I assume that this document is the product of professionals in the field of behavior analysis, and constitutes suggestions for research which might be funded by NIE. I further assume that there is some implication that NIE might in the future develop requests for proposals for contracts on research in one or more of the listed areas.

First, I wish to applaud this kind of effort to structure funding. While discussing the relative advantages of agency initiated contracts versus field initiated proposals, an agency representative recently commented to me that contracting provides an agency the opportunity to influence the directions various fields pursue but the contracting philosophy assumes that agency staff are wiser in determining appropriate areas of work than are professionals in the field. She added that the assumption is not always justified. The NIE position represented by this document would seem to have some of the virtues of both of these approaches. Professionals from the field and agency staff are brought together to jointly determine possible areas of funding emphasis.

The range of possible research described in the document is broad -- perhaps sufficiently broad to encompass almost any research a behavior analyst might pursue. However, just as there might be some danger in allowing an agency to too strongly determine the directions pursued by some field, there might also be some disadvantage in too strictly limiting funding to the suggestions of a panel of field experts. The disadvantages, of course, are that such funding practices tend to exclude the good ideas that may not have been anticipated or work on the not yet evident problem demands that may be thrust on the field. I would strongly urge that, if NIE will devote funding to behavior analysis, it set aside some portion of the available funds for field initiated studies. A review panel made up of field representatives and agency staff might then review such proposals for funding or possibly determine that the field initiated proposals are not as deserving as contract programs which should, therefore, receive the money otherwise set aside for field initiated work.

Generally the work proposed by the documents is closely geared to existing systems of public and higher education. The program, Tests of Planned Variations (3.4.5) may be intended to be sufficiently broad to include alternatives to existing structures but it is not developed in sufficient detail to be clearly appropriate to this point. I would agree that a major emphasis on work related to existing structures is appropriate. However, I would also argue that simply looking at ways in which behavior analysis might work to improve the functioning of present systems is contrary to the developmental model behavior analysts say they

follow in attacking problems and may produce outcomes less desirable for everyone in the education enterprise than could be obtained with another approach. The behavioral model would seem to start by defining a behavioral objective, say whatever skills, attitudes, etc., parents want their children to learn, developing techniques and procedures and structures to produce that objective, determining the professional skills necessary to carry out those techniques and procedures, developing methods to teach those skills to professionals, etc. The structural and professional by-products of pursuing such a model might or might not be far better than those that have resulted from the naturalistic workings of many forces. Moreover, the research problems that would result from pursuit of such a model might be very similar to those described in the document. Nevertheless, I have seen the strategy of the developmental model work often enough that I have confidence that it eventually produces a satisfactory outcome. Patchwork on existing structures often generates useful technology and sometimes leads to real improvements in outcomes, but it, in my experience, rarely generates outcomes as satisfactory as those yielded by use of the model. If "Tests of Planned Variations" is not intended to include the pursuit of a model as I have described, I would urge that NIE set aside some of its funding for research on alternative educational programs which are not dictated by preconceptions or theory but are produced by utilization of our research strategy.

I think the panel did a good job in thinking through the alternatives for possible research. I would argue that some of the research and work areas seem to be aimed at selling or disseminating technology that is yet unproven. Proposals that I would categorize in this way include: 3.1, 3.1.1, 3.1.1.1, 3.1.1.2, 3.1.2, 3.1.3, 3.1.3.1, 3.1.3.2, 3.1.3.4, 3.3.1.5, 3.3.2, 3.3.2.2, 3.3.3, 3.3.4, 3.3.5, 3.3.5.1, 3.5, 3.6.1.2, 3.7.2.1, 3.7.2.2, 3.7.3 and 3.7.3.1. In each case it seems that the proposed activity assumes that some more fundamental procedure or process has been proven effective. For example, I would agree that there is sufficient empirical evidence to suggest that it may be profitable to develop parent training programs and methods for introducing behavior analysis into preservice training. However, I would recommend that they be not only developed but also tested before they are promoted. Again I believe I am urging that we stick to our general philosophy of basing our practices on empirical evidence rather than presuppositions of their worth.

To elaborate on this point, consider the series of proposals dealing with preservice education. There is virtually no evidence that any form of preservice training is effective to help teachers teach students and absolutely no evidence that teaching trainees the concepts and procedures of behavior analysis, teaching the technology to teachers

of trainees, making preservice experiences like classroom situations, etc. are similarly effective. Perhaps the very fundamental problem here is to develop and test some potentially effective preservice training program. It might be a best bet to include the above mentioned ingredients in the program. However, I would recommend that they be tested as well as developed and I would beg that we not try to disseminate and increase utilization until those tests yield positive results. Behavior analysis has probably yielded more empirically effective bits and pieces of methods and procedures than any other movement education has known. There is no necessity that we extrapolate beyond proven technology to justify the work of the area. Let's make sure we have our technology together before we try to sell it to the world. I believe supporting the development and testing of promising technology is closer to NIE's mission than is the simple promotion of rational sounding but unproven technology.

I am not sure if I am serving as a reviewer for the panel, NIE or both. Assuming that I have responsibilities to the agency, I would doubt that projects such as 3.1.2.1, 3.1.2.2, and 3.1.2.3 should receive high priorities. They deal with legitimate human problems which are probably researchable though fraught with tremendous measurement problems. Nevertheless, the problems and appropriate solutions for them are probably identical in the populations of teachers and peoplekind in general. Unless some strong case could be made that such problems occur frequently among teachers and that, when they occur, they impede the progress of students, I would recommend that the funding and management of such programs be referred to NIMH.

The document includes little on relative priorities. Nevertheless, it would seem important to establish or recognize these before a contracts program began. For example, evaluation of many of the other proposed programs would require that first some consensus be developed perhaps as a result of processes described under 3.4.4, Goal Measurement, or 3.6, Develop and Evaluate Measures of Teaching Processes and Outcomes. Similarly, emphases such as self-control (3.3.6 and 3.6.3), humanistic goals (3.4.3), creativity, initiative and problem solving (3.4.4.1) and effect (3.6.3) must reflect the values of panel members or perhaps current hot topics within education. It would make sense to defer research in these areas until other projects such as 3.4 and 3.6.2 on goal setting and consumer satisfaction had indicated whether or not the emphases are high priorities as far as professionals and parents are concerned. The point here is that it is unlikely that NIE could simultaneously develop contracts for all of the listed areas of work. Some method must be developed to set rational priorities.

I agree that it would be desirable to have objective data evaluation procedures. I would extend the 3.6.6 recommendation a bit further to suggest that it would be desirable to have procedures which can be applied independently to: 1) means and variances and 2) generality over subjects or repetitions over trials. Too many of the currently available statistical procedures yield answers which are based on all of these variables so that subjective judgments are still required to interpret interactions between sample size and significance level.

There are other areas of research, not mentioned in the document, which would seem to be appropriate for behavior analysis. These include such things as the development and testing of curriculum materials and tests of variations of ecological variables. The bread and butter of behavior analysis to date has been in the area of innovations in teaching methods. I am sure that all possible methods have not been studied. I would hope that funding could be available for further research in this area. Such innovations are hard to anticipate and it is likely that funding in this area could better be done through a field initiated studies program than through a contracts program.

From a rational viewpoint, I particularly appreciate the many emphases on providing trainees, teachers, students and parents input into decisions about education. Empirical tests of the effects of these provisions may indicate that they do not lead to improvements in education (even though these groups must define "improvements" for us). Nevertheless, the politics of education seem to demand that we determine the importance of these possibilities.

I have been critical of a few elements of the document, particularly the apparent emphasis on disseminating untested technology and the failure to develop priorities or recognize the necessity that some of the suggested work can be maximally useful only after other suggested work has been completed. However, it should be recognized that, according to NIE, the panel only had a short time to work together. I can imagine the difficulties they must have had -- learning to talk some common language (Yes, there are different flavors of behaviorists.) -- compromising on various pet priorities -- getting the points of agreement organized and into readable form. The task must have been formidable. Given those constraints, I think the product is remarkably representative of what I see as the areas of greatest potential of the field. I fully expect that many of the points I identified as shortcomings were in fact failures to obtain completely accurate wording because of time pressures rather than deviations from behavioral philosophy. I think the panel did an excellent job. Investigators in the field and, I hope, the children of the world are deeply indebted to them.

The existence of the panel and the document are encouraging to me. I am sure that only a very small percentage of the publications on behavior analyses of educational problems have been supported by NIE or OE. Furthermore, I have talked with several behaviorally oriented investigators who have declined to submit field initiated proposals to NIE and OE because they have assumed that reading panels would be primarily composed of more traditionally oriented education researchers who would, at best, be ignorant of behavior analysis methods, procedures and technology and would, at worst, often be openly hostile to the field. The panel and document are something of an indication of NIE's interest and trust. I will hope that the field has the opportunity to reinforce these attitudes.

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Participant at Large: Arthur Coladarci, Stanford U.
Panel Coordinators (Staff, Arthur Young & Co.): Sandra Lafe Smith, William Callahan, Lillian Handy, Mary Carey, Albert Schreiber, Mark Versel, Blair Curry, Gerald Decker, Joseph Ryan, Elsa Graitcer

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